

**Development of Resource Material to Reduce the Communication  
Barriers faced by Allied Healthcare Professionals while Communicating  
with Stroke Patients**

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**Project title: Development of Resource Material to Reduce the Communication  
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**ABSTRACT**

**Objectives:** The objectives of the study were (1) to document the common communication barriers faced by allied health science professionals while communicating with Stroke patients, (2) to develop and validate the resource material to address the most common communication barriers faced by professionals while communicating with Stroke patients and (3) to document the outcome measures as specific communication strategies for facilitating communication between health care professionals (HCP) and persons with stroke.

**Design:** Prospective impact evaluation research and pre-post comparison.

**Method:** In Phase 1, a systematic review and semi-structured interview were carried out to investigate the barriers faced by allied healthcare professionals. To collect and compile information, a questionnaire was developed and validated by HCPs. Based on the ratings of HCPs, barriers were identified for the development of the material. Phase 2 had the participating Speech Language Pathologists (SLPs) provide strategies for the identified barriers in Phase 1. Later in Phase 3, orientations were provided to the selected allied healthcare professionals, along with pre- and post-tests. The scores of the pre- and post-tests were subjected to statistical analysis.

**Results:** The outcomes of the pre- and post-tests were analysed, and median and range scores across participation were considered. Further, a significant difference was noticed in pre- and post-test scores, and the material was found to be effective in enhancing good knowledge to overcome barriers related to communication breakdowns, environmental modification, time, work-related aspects, handling co-morbidity, and psych-emotional issues of stroke patients.

**Conclusion:** The current study focused on identifying barriers and facilitators across a wide range of post-stroke conditions. Future studies may narrow down the barriers and facilitators to specific conditions, since different disorders exhibit different symptoms and features, and adopt mixed-methods approaches and explore communication barriers beyond hospital settings. It will furthermore be helpful for HCPs.

# **Chapter 1**

## **Introduction**

Communication in healthcare refers to the purposeful exchange of information, thoughts, and emotions between professionals and patients. Adequate communication or the exchange of information between patient and health care professionals is crucial and the foundation for effective treatment (Epstein & Street, 2011). It is a central clinical function in building a therapeutic clinician-patient relationship. The relationship between the patient and professionals will help to build trust and transparency, which are essential components for decision-making on diagnosis, prognosis, and explaining the uncertainties (Hall et al., 1981). Therefore, the communication that helps to build the relationship is the heart and art of the treatment or rehabilitation of patients, since it is important in the delivery of high-quality, safe, and cost-effective health care (Silverman et al., 2016; Street et al., 2009).

Consequently, effective communication is considered a fundamental clinical skill across healthcare disciplines and is especially critical when working with populations vulnerable to communication breakdown, such as individuals with neurological disorders. Inadequate communication is associated with reduced engagement between patients and professionals, poorer health outcomes, and psychosocial factors. As such, communication difficulties associated with individuals with stroke can create a significant barrier to their involvement in their medical management and rehabilitation (Damico & Simmons-Mackie, 2003).

Stroke is a clinically defined syndrome of acute, focal neurological deficit attributed to vascular injury, such as infarction or hemorrhage of the central nervous system. Hypertension, diabetes, physical inactivity, and poor diet were all found to be the major causes for more than 80% of the global risk of all types of strokes. Other risk factors, such as excessive alcohol consumption, dyslipidaemia, cardiac causes, and psychosocial stress or depression, were included under the

remaining 20% (Murphy & Werring, 2020). Qualitative methods using depth interviews were conducted by Pound & Gompertz in 1998 in order to explore subjective accounts of the consequences of stroke. They reported several ways in which the stroke had affected their daily lives, including difficulty with leaving the house, doing the housework, pursuing former leisure activities, inability to walk in the way they wanted, problems with communicating, washing, bathing, and dressing, and confusion and deteriorating memory. Communication-related difficulties include language loss, cognitive skills loss, and coordination problems within the speech subsystem, which result in communication impairment (Brady et al., 2016). In all these areas, people described the loss of social contact that accompanied these changes, as well as the loss of valued roles embedded in the everyday functions they had previously performed. In general, people over the age of 70 were more seriously affected.

According to the survey conducted by the World Health Organization in 2005, stroke was the major cause of 16 million individuals' sufferings and 5.7 million deaths. WHO also estimated that these numbers may reach 23 million and 7.8 million respectively, by 2030. Stroke is the second leading cause of preventable death worldwide and the fourth leading cause of lost productivity (World Health Organization, 2008), as measured by disability-adjusted life years. The World Health Organisation also estimated that 93.08 million cases of stroke-related disability were reported globally till 2021, and 11.9 million new cases were reported in the same year. Stroke was the third major cause of death and disability throughout the world in 2021. Moreover, the global burden of stroke measured in disability-adjusted life years (DALYs) rose from 137 million in 2000 to 160 million in 2021, reflecting substantial increases in prevalence and long-term disability due to stroke, and continued to remain a major public health challenge (Feigin et al., 2024).

Indian epidemiological studies show considerably higher incidence and prevalence than in countries with high socio-economic status. Over the past three decades, the total number of

new stroke cases in India has increased markedly, with more than 1.25 million new stroke cases recorded in 2021, and the overall number of individuals living with stroke rising from an estimated 4.4 million in 1990 to 9.4 million in 2021, representing nearly a 47% increase (Kamalakannan et al., 2017). These figures highlight the growing burden of stroke in India and underscore the need for enhanced preventive and rehabilitative healthcare strategies.

Effective communication contributes significantly to the treatment or rehabilitation of the stroke patient across all stages, including chronic management in emergency at ICU, inpatient rehabilitation and follow-up for long-term. Across all these stages, stroke patients are required to comprehend the instruction, provide attention, respond, and provide respond to health professionals and family (Silverman et al., 2016). Communication demand across the setting varies; in the ICU and ward, stroke patients always experience reduced consciousness, severe comprehension and expression impairment, and healthcare professionals completely depend on nonverbal response and other retained abilities. Whereas in a rehabilitation setting, professionals rely on stroke patients' abilities to actively comprehend and express basic needs, providing feedback and engagement in decision making, and hence place a greater demand for communication (Biel & Haley, 2023; Happ et al., 2011a; O'Halloran et al., 2012; Simmons-Mackie et al., 2010a).

In addition to communication problems, stroke patients often experience physical, emotional, cognitive and psychosocial problems that significantly affect the independence in daily living activities and overall quality of life. Motor impairment: hemiparesis, reduced balance and coordination of motor movements; Cognitive deficits: attention, memory, visuospatial ability, decision making skills and executive functions, anxiety, depression and reduced motivation are common consequence affecting the independence, quality of life, participation in treatment and therapeutic activities (Hackett & Pickles, 2014; Langhorne et al., 2011a).

According to the World Health Organization (2011), access to appropriate rehabilitation constitutes a fundamental human right. Consequently, rehabilitation services must be accessible to all individuals who require them, including stroke survivors with aphasia, who need communication supports that enable their meaningful participation in rehabilitation-related decision-making. Stroke rehabilitation involves team approach to enhance the independence and to improve the quality of life. The neurologist, as a core team member plays crucial role in confirming diagnosis, determining the type and severity of stroke, initiating medical or surgical management and in recommending appropriate referral and follow up. Team include physiotherapist to address motor impairment and mobility limitations whereas speech language pathologist helps in managing communication, cognition and swallow issues and enhance the quality of life. Intervention by psychologist is often required to address anxiety, depression and emotional issues while nurse play a key role in facilitating the early recovery (Langhorne et al., 2011b; Pollock et al., 2014; Teasell et al., 2003).

According to Burns et al. (2015), the primary challenge for allied healthcare professionals is to overcome the communication barriers, as many allied healthcare providers do not know how to communicate with patients with communication disorders. It is revealed that allied healthcare professionals frequently underestimate the cognitive abilities of patients with communication disorders (Fox & Pring, 2005), control conversation topics with the patients, and mainly emphasize provider-specific tasks instead of patient-specific tasks (Gordon et al., 2009; Hersh et al., 2016). Most of the allied health care providers receive little or no training in meeting the communication needs of stroke patients, leaving the service providers ill-equipped to deliver optimal patient-centered care.

In the study conducted on persons with aphasia, it was reported that patients' participation was minimal due to a lack of awareness and inadequate support by professionals and caretakers (Moss et al., 2004). Wellwood et al. (1994) reported that patients opined that because of

inadequate information provided by health care providers, it was difficult to understand their current level of reduced function and associated difficulties. Kagan et al. (2001) reported that health care providers have the ability to significantly reduce communication barriers with increased understanding and tools, to facilitate involvement.

To address the communication barriers faced by healthcare professionals, training programs, assistive tools, and evidence-based communication have been developed and implemented across ICUs, wards, rehabilitative, and long-term care settings. Structured training programs, such as communication partner training (CPT), play a considerable role in educating physicians, nurses, other allied therapists, and caregivers on strategies. Research has shown that when communication partners (such as family members or health professionals) receive training in support conversation techniques, they can reduce communication difficulties. Those techniques helped patient to overcome communication barriers and to take part in everyday activities, decision making, and also to allow them to use their strength in thinking and social interaction (Happ et al., 2011b; Simmons-Mackie et al., 2010b).

Assistive devices, including both low- and high-tech augmentative and alternative tools, are widely available across different settings. Low-tech AAC tools, including picture communication boards and pain scale, are particularly used in emergency and ICU settings to elicit minimal response to establish and ease communication between patient and professional, whereas high-tech AAC, such as tablet-based applications, enable the convey of complex messages (Gohsman & Johnson, 2023).

In the recent study, Hanan et al. (2026) conducted a three-round Delphi study by involving various 16 healthcare professionals from multiple disciplines in and around India to identify the various communication challenges and strategies used in acute aphasia care in a hospital setup. The study revealed that effective communication with people with aphasia was

influenced by various factors, including patient-related factors, healthcare professional-related factors, environmental barriers, and cultural and linguistic factors, which were common in the multilingual Indian hospital setting. To address these barriers, healthcare professionals reported using appropriate strategies, including visual and nonverbal aids for these individuals, simplified language sentences and structures, simple yes/no questions, caregiver involvement in assessment and management, interpreter involvement, and technology-assisted communication in the assessment and management setting. Further, the study proposed a culturally sensitive communication partner training module for healthcare professionals that primarily emphasizes communication strategies, environmental modification methods, practical training in assessment and management, and awareness of psychosocial, cultural, and linguistic factors prior to rehabilitation.

In addition to available structured training programmes and assistive tools, there is a need to identify, systematic integration and to produce evidence on effective communication strategies to overcome the barriers and to collectively contribute to the patient participation and rehabilitation outcome. (Street et al., 2009; Teasell et al., 2003).

### **Need for the study**

Even though the past literature has shown positive impacts of communication training for allied healthcare professionals, most of this literature has focused on Western allied healthcare providers. As one-third of stroke survivors reveal communication disorders with aphasia or impairments in understanding spoken language, the treatment of these patients requires the involvement of professionals from diverse disciplines. Addressing the needs of patients with stroke and improving patient-provider communication is extremely important.

Allied healthcare professionals overseas receive training as a part of their academic curriculum on patient-centered communication that can be helpful in patient-clinician decision-making,

interviews, and providing treatment-related information (Baile et al., 2000; Egnew et al., 2004; Mauksch et al., 2008). Allied healthcare professionals are taught, in general, the patient–provider communication training using the “teach-back” method to confirm that the patient has understood the instructions given by the clinician. In the teach-back method, the allied healthcare professional provides the instructions and then asks the patient to reverse the role and repeat the instructions provided to him (Paasche-Orlow et al., 2006). As these programs intend to improve the general communication skills of allied healthcare providers, the communication of the allied healthcare provider can be effective with patients without communication disorders. However, there are no training programs for allied healthcare providers to effectively do teach-back or communication modifications among patients with communication disorders, especially in India. Therefore, addressing the needs of patients with stroke and improving patient-provider communication is extremely important. Recognising the differences in linguistic and cultural diversity, health care environments, communication contexts, and the patient’s needs between the Western and Indian context, there is a need to introduce new programs for the current and future allied health science professionals to communicate effectively with stroke patients so that these patients are also involved actively in patient-provider communication during consultation and decision-making.

### **Aim of the study**

The aim of the present study is to document the communication barriers faced by allied health care professionals and to develop and validate the resource material for professionals to overcome the communication barriers while communicating with Stroke patients.

## **Objective of the study**

- To investigate the common communication barriers faced by allied health science professionals while communicating with Stroke patients.
- To develop and validate the resource material to address the most common communication barriers faced by professionals while communicating with Stroke patients.
- To investigate the effectiveness of the material by comparing the pre-test and the post-test scores of knowledge-based questionnaires and confidence rating scale.

## **Chapter 2**

### **Review of literature**

#### **2.1 Stroke and consequences of stroke on communication and quality of life**

Aphasia, dysarthria, and apraxia of speech are observed as predominant post-stroke deficits and have an immense impact on life satisfaction. The occurrence of aphasia, dysarthria, and apraxia of speech following a stroke will have an adverse effect on the quality of life in individuals, which may be attributed to the limited physical abilities, communication skills, and psychosocial issues. The literature indicates the presence of communication difficulties and psychosocial issues among stroke individuals as reported by their caregivers and also from professionals' perspectives (Hermann & Wallesh, 1989; Shewan & Cameron, 1994; Rolnick & Hoops, 1969). Semi-structured interviews were conducted by Le Dorze, Croteau and Baril (2007) to examine the consequences of post-stroke on the relationships between the persons with aphasia (PWA), their family members, friends and health care professionals (HCPs). The findings of the studies revealed that the PWA had severe language-related difficulties, an inability to control coprolalia and emotional outbursts, which affects the psychological well-being of the family members.

Effective communication between individuals with stroke and healthcare professionals plays a significant role across all stages of recovery, as it directly affects accurate diagnosis, prognosis, and treatment planning of the patient. In the acute phase, effective communication is time-sensitive, and communication demands are high due to the rapid exchange of medical information, such as signs, symptoms, basic needs, and in obtaining consent (Brady et al., 2016). In the subacute stage, increased demand was seen due to patient involvement in therapeutic activities with the multidisciplinary team. Whereas in the chronic stage of rehabilitation, communication demands become much more complex to reintegrate into the community and social environment (Dalemans et al., 2010).

## **2.2 Prevalence of post-stroke communication disorders**

### **a. Aphasia**

Aphasia is a communication disorder caused by damage to the brain region that controls language functions and other communication abilities. The most common etiology of aphasia is stroke; however, it can also be generated due to a brain tumour or any progressive neurological disease. 21-38 percent of aphasia patients were affected by acute stroke, and associated with mobility issues, financial burden or mortality issues (Berthier, 2005). The various epidemiological statistics have significant global implications affecting 1.5 to 4 million people per year. Stroke has a high global burden, with a prevalence of 25.7 million in 2013 and 10.3 million new cases annually (Feigin, 2017).

Communication disorders like aphasia secondary to stroke present chronic medical conditions, and these patients may not be able to modify their level of speech and language abilities. Therefore, greater focus must be placed on the role of the communication partner, i.e., the allied health professionals, to alleviate the patient's participation in the communication situation (Kagan, 1998; Kagan & LeBlanc, 2002; O'Halloran et al., 2011). Therefore, preparing allied health professionals with the necessary communication skills may be one of the best methods to improve communication access for patients with communication disorders. However, most allied health care providers receive little or no training in meeting the communication needs of this patient population, leaving providers ill-equipped to deliver optimal patient-centered care.

### **b. Dysarthria**

Dysarthria is referred to as a group of neurogenic speech disorders associated with dysfunction in speech subsystems and characterized by “abnormalities in the strength, speed,

range, steadiness, tone, or accuracy of movements required for breathing, phonatory, resonatory, articulatory, or prosodic aspects of speech production” (Duffy, 2020, p. 3). It is estimated that 22%–58% of individuals with acute stroke present with dysarthria (De Cock et al., 2021; Flowers et al., 2013; Safaz et al., 2016; Stipancic et al., 2019; Vidović et al., 2011). Collaboration and counselling of the patients, their caregivers, along with interprofessional education and practice, play an important role in decision-making for comprehensive management of dysarthria and are aimed at maximizing quality of life with the well-established communication between patients and professionals (Behrman et al., 2020).

### **c. Apraxia of speech**

Apraxia of speech (AOS) is a motor speech disorder caused by a lesion in the left cerebral hemisphere. It results in impairment of spatial and temporal planning and programming of movements required for speech production and is characterized by a slow rate of speech with SODA errors (Duffy, 2013), leading to impaired speech production, laborious everyday communication, and decreased quality of life. These speech production difficulties often limit participation in social, vocational, and family interactions, leading to communication breakdowns and reduced communicative confidence (Wambaugh et al., 2006). As a consequence, individuals may experience emotional distress, social withdrawal, and decreased autonomy, all of which negatively influence quality of life (Hilari et al., 2012). Stroke is the major cause of AOS in adults, but it can also be due to neurodegeneration, traumatic brain injury, or a brain tumour. AOS does not directly reflect impairment with respect to intellect or neuropsychological impairment since it’s a motor disorder, but they show poor performance with timed verbal fluency tests and in verbal-demand situations (Scheffel et al., 2021). The impact of AOS is often compounded when it co-occurs with aphasia or other neurological

impairments, further increasing activity limitations and participation restrictions in daily life (McNeil et al., 2009).

#### **d. Other cognitive communication disorder**

Cognitive communication disorder occurs due to neurological causes such as stroke, TBI, and degenerative diseases. In this condition, both linguistic and non-linguistic skills are affected (Coelho et al. 1996). Deficit in attention, memory, and executive function impacts the communication and quality of life of the disordered individual (Kelly et al., 2023).

### **2.3 Importance of interaction between allied health care professionals and stroke patients**

Communication impairment in post-stroke-related conditions limits the patient's ability to comprehend and express basic needs and information, and also limits active participation in the community, thereby increasing frustration and miscommunication and restricting the interaction between the patient and professional. Health care professionals must therefore adopt the communication strategies. Empathetic, respectful, and inclusive communication practices have shown significant improvements in participation and satisfaction with functional and psychosocial outcomes among patients who survived stroke (Hilari & Byng, 2009; Kagan, 2007).

### **2.4 Importance of interaction among allied health care professionals**

Clear communication on sharing documents and collaborative decision-making between the multidisciplinary team supports continuity of care and consistent rehabilitation goals and leads to improved functional outcomes, reduced hospital stay, and enhanced patient safety. Conversely, poor communication among professionals may lead to fragmented care and

suboptimal rehabilitation outcomes, highlighting the importance of structured interprofessional collaboration in stroke management (Langhorne et al., 2011; Reeves et al., 2017).

## **2.5 Perception and practical challenges faced by HCPs while communicating with stroke patients**

### **A. Communication Breakdowns**

Individuals with degenerative diseases, cognitive, communicative disorders, or stroke who are prone to communication disorders form a significant group among populations served by allied health science professionals and health care providers. Earlier studies documenting the impact of patient communication problems on adverse events in allied healthcare settings have revealed that patients with such communication disorders report being excluded from losing autonomy during consultation and decision-making as they rely on others to communicate for them (Burns et al., 2015; Fox & Pring, 2005; Hemsley et al., 2008; Law et al., 2005; Morris et al., 2013; Murphy, 2006). Maybe because of such factors, patients with such communication disorders are less satisfied with their health care (Hoffman et al., 2005), and this might be due to the adverse events faced by these patients in health care (Bartlett et al., 2008).

According to Burns et al. (2015), the primary challenge for allied healthcare professionals is the communication barriers, as many allied healthcare providers do not know how to communicate with patients with communication disorders. Several prior studies have also revealed that allied healthcare providers have encountered challenges in treating patients with communication disorders, as communication problems frequently impact their confidence in making accurate diagnoses and treatment recommendations (Burns et al., 2015; Skinder-Meredith et al., 2007; Ziviani et al., 2004). Past studies have also revealed that allied healthcare professionals frequently underestimate the cognitive abilities of patients with communication disorders (Fox & Pring, 2005), control conversations with the patients, and mainly emphasise

provider-specific tasks rather than patient-specific tasks (Gordon et al., 2009; Hersh et al., 2016). Lack of assistive devices to complete daily living activities for patients with cognitive communication disorder acts as a barrier to communication (O'Halloran et al., 2012).

## **B. Environmental Barriers**

A supportive communication environment plays a key role in improving patients' ability to communicate in acute stroke units. In a qualitative study conducted by Halloran and colleagues (2011), the aim was to identify environmental factors that act as barriers or facilitators to communication between HCPs and patients in a hospital setting. The interaction between 65 patients and their healthcare provider in a hospital setting was observed, transcribed, and analysed. 126 environmental factors were identified and grouped into 28 categories under seven themes, such as knowledge, communication skills, attitude, and individual characteristics of HCPs, in addition to the presence of family, hospital setup, and physical environment. This study implies that removing barriers and maintaining the identified facilitators will lead to better communication. The presence of caretakers or family members facilitates the identification of patients' strengths and weaknesses. Single room stay, with a single caretaker, may reduce the chance for incidental socialization (D'Souza et al., 2021). In contrast, issues with the physical environment, such as increased background noise and loss of patients' documents and written information, act as barriers to effective communication. In addition to ambient noise and responsibilities, restricted light, ventilation, room size, and lack of privacy act as physical barriers for effective communication and affect treatment outcomes (Brandenburg, 2017; Karlsson et al., 2010; Steele et al., 2011; Weaver, 2010).

## **C. Time and Workload Barriers**

In addition to spending enough time explaining the risks and benefits, sparing time to listen to patients' concerns directly impacts overall treatment improvement, and it's a reflection of the physician's respect for the patient. All patients' value respectful treatment; another aspect of communication (Quigley et al., 2014). Time constraints may also act as a physical barrier to nurse-patient communication (Hemsley et al, 2012; Moore et al, 2013). Stans et al. (2019) reported that strategies used by HCPs made the communication effective than the amount of time spent with the patients. For example, a 28-minute conversation with a fast rate, lengthier sentences, and asking multiple questions at the same time made the conversation less informative and less effective. In contrast, a 9-minute conversation that provided encouragement to patients to complete their own sentence and to initiate topic made the conversation more effective. Lack of successful communication is attributed to HCPs' time constraints, workload issues such as the presence of multi-critical patients, increased patient turnover in a short period, and difficulty in bringing HCPs together as a team (Heard et al., 2022).

#### **D. Emotional and Psychological Barriers**

As supported by the literature, in addition to patient-related factors such as mood, motivation, and personality, the psychological status of the HCPs may have an effect on the quality of care provided to the patients (Zamanzadeh et al., 2014). Low self-esteem, negative attitude towards patients, despair, or apathy towards the profession may affect the ability to counsel and provide adequate psychological support to the patient (Bartlett et al., 2008; Park & Song, 2005). In addition, anxiety and personal traits also as an effect on communication with patients (Arungwa, 2014; Steele et al., 2011).

#### **E. Cultural and Rural Barriers**

According to UNESCO, Culture refers to the collective beliefs, values, customs, and practices that characterize a particular group or society. It encompasses language, art, religion, and social norms, shaping how individuals interact with one another and perceive the world. Sociocultural backgrounds of both the HCPs and patient impact their relationship and communication (Arungwa et al., 2014). Attitude and behaviour of the HCPs may have an impact on their communication skill and could directly influence the effectiveness of communication (Tay et al., 2012). Using medical jargon as a reference language leads to difficulty comprehending the patient's condition, increased anxiety, and distress (Taylor, Cantlay, Patel, & Braithwaite, 2011).

#### **F. Comorbidity -related barriers**

Re-attained abilities with respect to hearing, vision, and sensory integration play a crucial role in effective communication in post-stroke conditions. Due to sensory loss, patients experience difficulties with speaking, listening, writing, and reading skills. Hearing loss is the most common consequence of post-stroke and can potentially interfere with rehabilitation. Studies reported that reduced speech perception due to processing deficit and greater severity of sensorineural hearing loss in post-stroke patients may affect interaction between HCPs and patients in addition to activity and participation (Purdy et al., 2016).

#### **G. Awareness and knowledge related to communication barriers and strategies**

Lack of knowledge and skills to communicate with stroke individuals is a major barrier, irrespective of the treatment setting. Lack of knowledge and confidence in repairing communication breakdown leads to avoiding interaction during treatment sessions. Communication breakdown may induce stress and anxiety for both patient and staff and hence HCPs are apprehensive towards encouraging patient to communicate (D'Souza et al., 2021).

Proper education and experience can allow HCPs to overcome communication barriers and engage in effective communication (Coleman & Angosta, 2016).

## **H. Other barriers**

Other demographic barriers, such as age, gender, language, and years of experience, may have a minor contribution toward effective communication. In a study conducted by Arungwa (2014), Nurses perceived four barriers to effective communication between nurses and clients. Culture was the biggest barrier to communication, with 36.25% of nurses reporting it as the predominant barrier. Language (31.25%), religion (23.75%), and gender (8.75%) were reported as negatively affecting nurses' communication with clients. Time constraints and culture were significant influences on nurses' interactions with clients and, at times, acted as barriers to effective nurse-client care and relationship development.

Limited language proficiency of HCPs may influence the development of connection, rapport, education, and client care. However, nurses with a strong inclination toward client-centered care were able to overcome these challenges and develop a satisfactory nurse-client relationship (Coleman & Angosta, 2016).

## **2.6 Existing communication toolkits, policy, and research gap**

The health care requirements of patients with communication disorders have received national consideration in several developed countries. The various committees, including the Joint Commission, have mandated enhanced accessibility of allied healthcare settings for patients with communication disorders (Kagan & LeBlanc, 2002; Law et al., 2005; Nordness & Beukelman, 2017; Patak et al., 2009; The Joint Commission, 2010). Several recommendations and guidelines address environmental barriers, preparing allied healthcare

providers and staff to interact effectively and respectfully with these patients (Baylor et al., 2019; Mach et al., 2022).

It is important for all allied professionals to identify and then adopt strategies to overcome the barriers that may be present. A large number of studies have been conducted in the West to identify both barriers and facilitators of communication, whereas research in India is relatively limited in number and variety. There is a lack of readily accessible resource material for the Indian context that clinicians can implement without extensive technology. Here is an attempt to develop a resource material to help the HCPs communicate effectively with individuals afflicted with Stroke.

## **Chapter 3**

### **Method**

The present study was carried out in three different phases. Phase 1 involved a systematic review and a semi-structured interview to document the communication barriers healthcare professionals' face when communicating with stroke patients. Phase 2 involved developing a resource material for the same, whereas phase 3 included details on the orientation carried out for the professionals using the developed material and on evaluating its effectiveness.

#### **Phase 1: Development of a questionnaire to assess the communication barriers for Allied Health Care Professionals (HCPs) while communicating with Stroke Patients.**

##### ***Step 1: Systematic review***

A questionnaire was developed based on the systematic review and semi-structured interview. For the systematic review, studies published in indexed journals on communication barriers encountered by allied healthcare professionals with patients with various communication disorders were considered.

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards were followed in conducting the systematic review. The literature search was conducted in February 2025. Substantial changes in clinical guidelines, service delivery models, and communication strategies have occurred since 2005, making earlier literature less relevant to current practice, whereas recent studies highlight the contemporary technical advancement and evidence-based approach, and hence, studies published from 2005 to 2025 were only included for review. The following online databases were used: PubMed, Cochrane,

Google Scholar, Semantic Scholar, Directory of Open Access Journals (DOAJ), and Research Gate. Table 3.1 summarizes the search phrases used in the study.

**Table 3. 1**

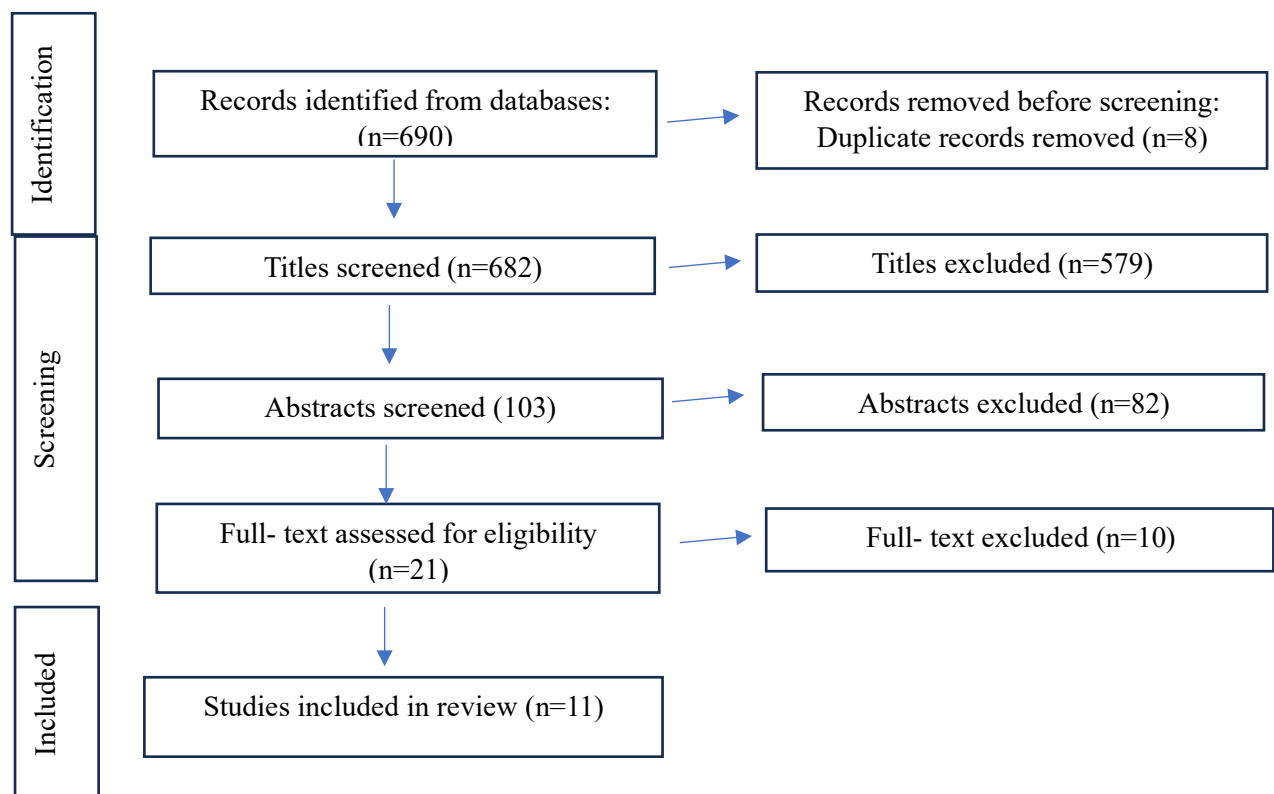
*Summary of the search phrases used in the study.*

| Domain            | Domain Keywords                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Population        | Stroke, Communication Disorders, Healthcare Professionals, Speech Language Pathologists, Physiotherapist, Nurses, Occupational Therapists, Medical Social Workers, Aphasia, Intellectual Disability, Parkinson's Disease, Acute Stroke, Chronic Stroke, Dysarthria, Hearing Impairment, Dementia, Huntington's Disease, Spastic Dysarthria, Ataxic Dysarthria, Flaccid Dysarthria, Mixed Dysarthria, LMN Dysarthria, UMN Dysarthria, Global Aphasia, Broca's Aphasia, Wernicke's Aphasia, Transcortical Motor Aphasia, Transcortical Sensory Aphasia, Anomic Aphasia, Conduction Aphasia, Isolation Aphasia |
| Outcomes          | Communication Barriers, Language Barriers, Environmental Barriers, Teach-back communication, Material Communication, Nonverbal Communication, Questionnaires, Tools, Strategies, Training, Delivery of Health care, Communication Aids for the disabled,                                                                                                                                                                                                                                                                                                                                                    |
| Boolean operators | 'OR' and 'AND'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

Participants included in the studies were HCPs involved in rehabilitating individuals diagnosed with communication disorders, including individuals with stroke, Parkinson's disease, and emergency ward patients. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart was followed in the present study, and the PICO (Participant, Intervention, Comparison, and Outcome) framework was used to assess study eligibility. As shown in Figure 1, the database search yielded 690 studies after merging using Mendeley

Reference Manager. Eight duplicates were removed. Title screening was conducted for the remaining 682 studies; those that met the inclusion criteria were retained, while the remaining 579 were excluded. The abstracts of these 103 studies were reviewed, and 21 were retained for full-length review. The full texts of these 21 studies were reviewed. Ten studies were excluded since they were not the original research articles. Eleven studies were retained as they were found eligible. Among 690 studies, 679 were excluded because the targeted participants and outcome measures were unrelated or inadequately reported. A few articles were book chapters and conference abstracts without full text, and hence those studies were excluded.

Figure 3.1 *PRISMA Flowchart*



*Note: n = number of articles*

Later, the Critical Appraisal Skills Programme (CASP) checklist for qualitative assessments and the cross-sectional study checklist were used to assess the quality of the included qualitative studies and the risk of bias across them. The CASP checklist was used by four SLPs

to critically evaluate and note the positives, negatives, and unknown aspects of the reviewed studies. Initially, the procedure was carried out by a group of 2 SLPs separately; later, scores were exchanged and cross-verified to resolve disagreements between them. Based on the scores, 11 articles were retained for the review. At the end, Probing questions were developed from the findings of the systematic review.

### ***Step 2: A semi-structured interview***

***Study setting:*** Convenience sampling was used, and semi-structured in-person interviews were conducted. An interview was held at the time and location chosen by the participants, in a setting that provided a private and confidential space. A quiet environment was maintained to minimize interruption and to ensure the integrity audio-recording of the interview.

***Participants:*** Six health care professionals (HCPs) were interviewed; details of the participants are presented in Table 3.2. Each had at least 2 years of clinical experience in the management of stroke patients and was currently working in a hospital or rehabilitation centre. Professionals who provided informed consent as shown in Appendix 2 were included to participate in the semi-structured interview. Students and trainees not independently involved in patient care were excluded. A sample size of six participants was consistent with qualitative methodologies such as phenomenology, where the aim is to select participants who can provide detailed explanations of the specific research topic, with recommended sample sizes often ranging from 5 to 25 participants (Guest et al., 2006).

**Table 3.2***Details of participants involved in the semi-structured interview.*

| Sl no                           | Participants                | Work-Setting          | No of participants |
|---------------------------------|-----------------------------|-----------------------|--------------------|
| 1.                              | Physiotherapist             | Hospital              | 1                  |
|                                 |                             | Rehabilitation centre | 1                  |
| 2.                              | Nurse                       | Hospital              | 1                  |
| 3.                              | Speech-language pathologist | Rehabilitation centre | 1                  |
| 4.                              | Doctor                      | Hospital              | 2                  |
| <b>Total no of participants</b> |                             |                       | <b>6</b>           |

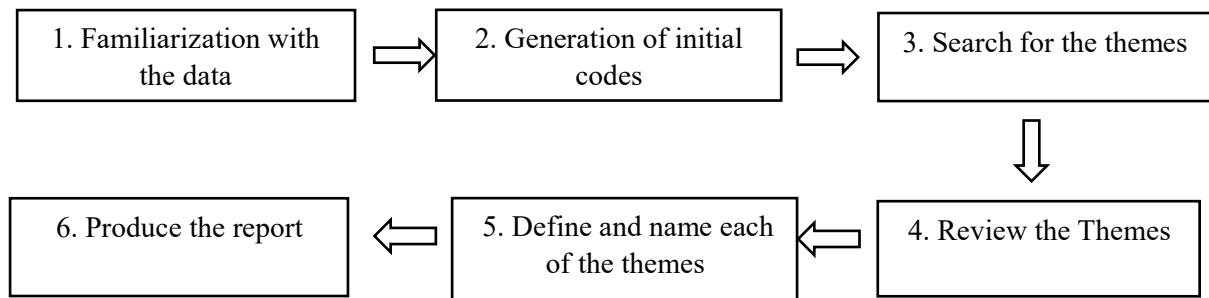
**Material:** The barriers identified in the review were used for conducting semi-structured interviews. The open-ended questions were developed from a review of journal literature on communication barriers faced by healthcare professionals in caring for stroke patients. Probing questions were divided into two sections: Section 1 contained introductory questions aimed at eliciting information on years of experience and the range of case exposure, whereas Section 2 focused on communication barriers. 30 questions were validated by 2 experienced SLPs using a 3-point Likert scale. 27 Questions with ratings of 2 and 3 were finalized (Appendix 1) and used as probes during the interviews to investigate the barriers.

**Data collection:** An interview was conducted for 30-45 minutes per professional in offline mode (in-person), and the conversation between the author and the professional in Kannada was recorded by the 5<sup>th</sup> author using personal mobile phone (Galaxy, SM-M34) (to prevent difficulties in recalling the conversation) with the participant's consent. Interviews were conducted by two of the authors, and later the audio-recorded samples were transcribed.

**Data Analysis:** The collected information was analysed using the framework proposed by Braun and Clarke (2006), as shown in Figure 3.2.

Figure3.2.

*Framework for content analysis*



The fifth author listened to and transcribed all audio-recorded samples to gain a better familiarity with the collected samples. After thorough reading and familiarization with transcribed data, a list of interesting, meaningful, and repeated aspects across the samples were generated as codes.

Table 3.3

*Example for the generation of meaningful or repeated units and code*

| Meaningful & Repeated units                                                              | Code         |
|------------------------------------------------------------------------------------------|--------------|
| Patients show frustration at the inability to recall.                                    | Recall       |
| The sense of hopelessness about the future will reduce the motivation level in patients. | Hopelessness |

The next step was to search for the themes using the generated code list. Various codes were grouped into sub-themes, and coherence and differences among the themes were observed by generating a thematic map. By recognising the essence of each sub-theme's content and deciding aspects, the main themes were defined and named. At last, the final report of the analysed, coherent, and non-repetitive data was generated, based on the occurrence of certain codes.

### **Step 3: Instrument development and validation process**

After coding and **thematic analysis**, the semi-structured interview outcomes were validated. 56 questions were developed based on meaningful units, codes, and subthemes, and subjected to content validation. The review panel of experts comprised 5 SLPs, 2 physiotherapists, and 2 doctors with a minimum of 2 years of experience and strong exposure to the assessment and management of stroke patients.

Content validation was conducted in offline mode, with each session lasting 60-90 minutes and including rating the degree of relevance and providing comments to improve all 56 items. Experts were instructed to rate the content on a 3-point scale, where '0' indicated an 'irrelevant item to assess communication barriers encountered by professionals while communicating with Stroke Patients' and '2' indicated a 'relevant question to assess communication barriers encountered by professionals while communicating with Stroke Patients'. Upon completing the review, the experts were requested to provide an independent score for each item on the relevant scale and to submit their responses to the 5<sup>th</sup> author.

Items with a score of '2' were only considered for I-CVI calculation (Saiful & Yusoff, n.d.2019). The items with an I-CVI score of 0.8 or higher were only considered, and hence, the number of barriers or items was reduced from 56 to 31(31 items in Appendix 3). To identify potential barriers, 31 finalized items were given to 50 healthcare professionals (7 doctors, 15 nurses, 13 physiotherapists, and 15 SLPs) to rate on a 5-point Likert scale (1-strongly disagree, 2-disagree, 3-neutral, 4-agree, and 5-strongly agree). Scores of strongly agree and agree were combined, and items meeting the 60% criterion were retained. 28 items meet with 60% criterion, out of which 2 items related to AAC were removed, since the material is exclusive of AAC. Under 8<sup>th</sup> theme all the items scored less than 60% criterion and hence it is removed. Finally, 26 items across 7 themes were subjected to material development.

**Phase 2: Development of resource material to address the most common communication barriers faced by Professionals while communicating with Stroke Patients.**

*Step 1:* The 26 communication barriers were provided to three experienced speech-language pathologists, and they were instructed to provide the appropriate communication strategies to overcome the communication barriers.

*Step 2:* With all the strategies suggested by SLPs, the resource material consists of the following content:

1. Introduction
2. Understanding Communication Challenges in Stroke: Types of Communication Impairments Usually Seen in Post-Stroke Individuals
3. Strategies to Overcome the Communication Barriers
  - A. Strategies to Overcome the Communication Breakdowns
  - B. Strategies to Overcome the Environmental Barriers
  - C. Strategies to Overcome the Time and Workload Barriers
  - D. Strategies to Overcome the Emotional and Psychological Barriers
  - E. Comorbidity-related barrier
  - F. Awareness and knowledge related to communication barriers and strategies
4. List of Communication Strategies with Pictorial Representations to Overcome the Communication Barriers

The prepared communication strategies to overcome the communication barriers were then reviewed by another group of three speech-language pathologists for appropriateness. SLPs were instructed to rate 12 parameters using a 5-point Likert scale (very poor, poor, fair, good, or excellent) for the overall material. Feedback and suggestions given by SLPs are detailed in the results section.

**Phase 3: Orientation for the professionals using the resource material and its validation.**

**Participants:** This phase included 15 allied health professionals (7 physiotherapists, 1 doctor, 3 nurses, and 4 socio-medical workers). Participants with prior exposure to the assessment and management of individuals with stroke were included.

**Data collection:** Data was collected twice from all the participants. Pre-test data were collected 2 weeks prior to the orientation program, and Post-test data were collected 2 weeks after the orientation program. Two outcomes were measured: i) knowledge test which had 10 multiple-choice questions (Appendix 5) to assess improvement in knowledge, and ii) confidence rating using 10 items (Appendix 6) that graded their level of confidence before and after the orientation.

**Procedure:** The participants, that is, 15 professionals were grouped into 3 groups based on their availability. Orientation programs were conducted for all participants in the three groups to teach communication strategies to overcome the communication barriers and facilitating better communication with stroke patients. Each orientation program had a lecture on communication strategies for 120 minutes with demonstrations and examples. The printed copies of the manual was provided to all participants in the three groups along with instruction to practice the communication strategies when communicating with stroke patients for the subsequent two weeks after the orientation.

**Study Settings:** Health care professionals implemented the common communication strategies (as mentioned in the material) when treating patients with stroke in their regular practice as in bedside OPD, wards, and therapy scenarios.

**Data analysis:** The responses for the two outcome measures, i.e., knowledge test and confidence rating scale, were analysed across the pre-test and post-test. The knowledge test consisted of 10 MCQs on the communication barriers faced and the communication strategies

used by professionals. For confidence rating, the clinical confidence rating scale consisting of 4-point rating was developed. The data were tabulated and statistically analysed using SPSS.

Kolmogorov-Smirnov and Shapiro-Wilk's test of normality was carried out to assess the distribution of data. The data were found to follow a non-normal distribution, and hence non-parametric tests were used to analyse, describe, and interpret the knowledge-based score in this section. The McNemar test was used to compare the pre- and post-scores of each individual item of the knowledge test, whereas the Wilcoxon signed rank test was conducted to see the overall improvement using the total scores of all 10 items. Total score of confidence rating scale for pre and post-test was normally distributed and hence subjected to a paired t-test, whereas individual items were not normally distributed ( $p > 0.05$ ) and subjected to a Wilcoxon signed-rank test.

**Reliability:** A follow-up was conducted with the same participants who were subjects in Phase 3 orientation after 15 days post-orientation, using 10 MCQ to assess test-retest reliability.

## Chapter 4

### Results

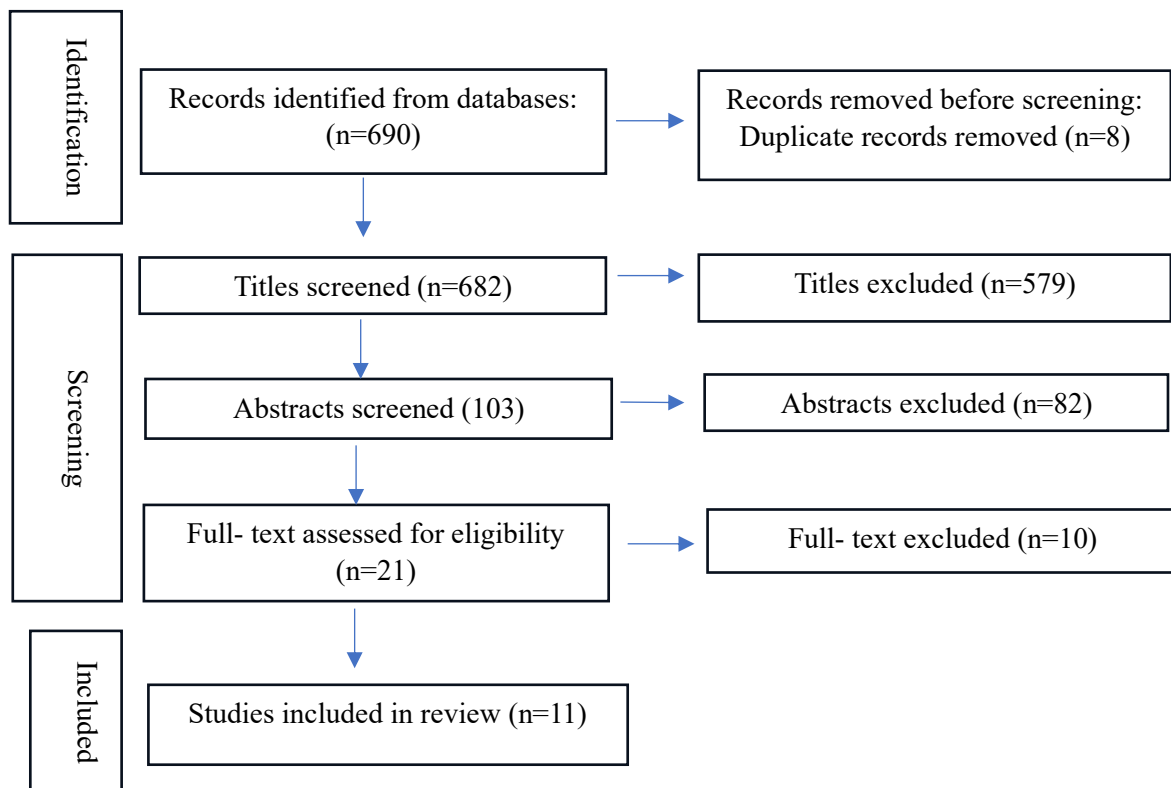
The aim of the present study was to develop resource material for professionals to overcome communication barriers when communicating with Stroke patients and to evaluate the effectiveness of the material. The results of the present study are presented Phase wise.

#### Phase 1

A systematic review, along with a semi-structured interview, was conducted to identify barriers and develop the questionnaires. Using the PRISMA framework (Figure 4.1), 11 eligible studies were retained.

Figure 4.1

*The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) flowchart for this scoping review*



*Note: n = number of articles*

The Critical Appraisal Skills Programme (CASP) checklist was used to assess the quality of the studies and the risk of bias across both the qualitative and cross-sectional studies included in the review.

### **Risk of bias**

Table 4.1 presents the results of the CASP qualitative research checklist, assessing the risk of bias across the qualitative studies included in the review. All the studies had strong methodological rigour and minimal risk of bias except two (Jain & Krieger, 2011; Sowney & Barr, 2007), which had lower scores due to limitations in research design, ethical considerations, or clarity in research aims to indicate moderate bias.

Table 4.2 applies the CASP checklist to assess the risk of bias in cross-sectional studies. The three cross-sectional studies reviewed (Al-Kalaldeh et al., 2020; Norouzinia et al., 2015; Verulava, 2023) were evaluated. The studies by Albahri et al. (as cited in Verulava, 2023) and Al-Kalaldeh et al. (2020) achieved the highest scores, indicating robust methodologies with appropriate recruitment strategies, rigorous data analysis, and clearly stated findings. In contrast, Norouzinia et al. (2015) received a lower score on the CASP checklist.

**Table 4.1**

*Outcomes on assessing the risk of bias across all studies using the CASP qualitative research checklist*

| Qualitative Study                                                        | Sowney & Barr         | O'Halloran et al.         | Jain & Krieger         | Stans et al. (Stans et al., 2018) | Armstrong et al. (Armstrong et al., 2019) | D'Souza et al. (D'Souza et al., 2021) | Heard et al. (Heard et al., 2022) |
|--------------------------------------------------------------------------|-----------------------|---------------------------|------------------------|-----------------------------------|-------------------------------------------|---------------------------------------|-----------------------------------|
| Assessment domains                                                       | (Sowney & Barr, 2007) | (O'Halloran et al., 2011) | (Jain & Krieger, 2011) |                                   |                                           |                                       |                                   |
| Was there a clear statement of the aims of the research?                 | Y                     | Y                         | N                      | Y                                 | Y                                         | Y                                     | Y                                 |
| Is a qualitative methodology appropriate?                                | Y                     | Y                         | Y                      | Y                                 | Y                                         | Y                                     | Y                                 |
| Was the research design appropriate to address the aims of the research? | N                     | Y                         | N                      | N                                 | Y                                         | Y                                     | Y                                 |
| Was the recruitment strategy appropriate to the aims of the research?    | N                     | Y                         | Y                      | Y                                 | Y                                         | Y                                     | Y                                 |

|                                                                                          |    |    |    |   |    |    |    |
|------------------------------------------------------------------------------------------|----|----|----|---|----|----|----|
| Was the data collected in a way that addressed the research issue?                       | N  | Y  | Y  | Y | Y  | Y  | Y  |
| Has the relationship between the researcher and participants been adequately considered? | Y  | Y  | Y  | Y | Y  | Y  | Y  |
| Have ethical issues been taken into consideration?                                       | Y  | Y  | N  | Y | Y  | Y  | Y  |
| Was the data analysis sufficiently rigorous?                                             | Y  | Y  | Y  | Y | Y  | Y  | Y  |
| Is there a clear statement of findings?                                                  | Y  | Y  | Y  | Y | Y  | Y  | Y  |
| How valuable is the research?                                                            | Y  | Y  | N  | Y | Y  | Y  | Y  |
| Scores                                                                                   | 7* | 10 | 6* | 9 | 10 | 10 | 10 |

*Note: Y = yes, N = no, \* = Lower score*

**Table 4.2**

*Outcomes on assessing the risk of bias across all cross-sectional studies using the CASP checklist.*

| Cross-sectional study Assessment domains                               | Norouzinia et al.<br>(Norouzinia et al., 2015) | Albahri et al.<br>(Verulava, 2023) | Al-Kalaldehy et al. (Al-<br>Kalaldehy et al., 2020) |
|------------------------------------------------------------------------|------------------------------------------------|------------------------------------|-----------------------------------------------------|
| Did the study address a focused issue?                                 | Y                                              | Y                                  | Y                                                   |
| Did the authors use an appropriate method to answer their question?    | Y                                              | Y                                  | Y                                                   |
| Were the subjects recruited acceptably?                                | N                                              | Y                                  | Y                                                   |
| Were the measures accurately measured to reduce bias?                  | N                                              | Y                                  | Y                                                   |
| Were the data collected in a way that addressed the research issue?    | Y                                              | Y                                  | Y                                                   |
| Did the study have enough participants to minimize the play of chance? | Y                                              | Y                                  | Y                                                   |
| How the results presented and what are is the main result?             | Y                                              | Y                                  | Y                                                   |
| Was the data analysis sufficiently rigorous?                           | N                                              | Y                                  | Y                                                   |
| Is there a clear statement of findings?                                | N                                              | Y                                  | Y                                                   |
| Can the results be applied to the local population?                    | N                                              | Y                                  | Y                                                   |
| Scores                                                                 | 5 *                                            | 10                                 | 10                                                  |

*Note: Y = yes, N = no, \* = Lower scores*

## **Study Characteristics**

Table 4.3 displays the characteristics of the study, participants, and outcomes measured across the studies reviewed. As shown in Table 4.3, this review includes both qualitative and quantitative research, with the majority being qualitative. Some cross-sectional studies employ structured questionnaires to assess the communication barriers. Most of the studies were conducted in hospital settings, reflecting the role of communication in high-pressure environments. However, Armstrong et al. (2019) expanded the scope to a university setting, evaluating communication barriers among neurologists, care partners, and patients (Armstrong et al., 2019).

**Table 4. 3** *Study, participants, and outcome measure characteristics across the studies reviewed.*

| Study ID                                    | Study Characteristics |                       | Participant Characteristics            |              | Outcome measure characteristics |                                                            |                                                                                          |
|---------------------------------------------|-----------------------|-----------------------|----------------------------------------|--------------|---------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------|
|                                             | Type of Study         | Study setting         | Participants                           | Sample Size  | Assessment Method               | Outcome measures                                           | Communication Challenges Faced                                                           |
| Sowney & Barr (Sowney & Barr, 2007)         | Qualitative study     | Hospital              | Nurses                                 | 27 nurses    | Focus groups                    | Communication Ability Scale                                | Cultural differences, differences in age, gender, and economic status                    |
| O'Halloran et al. (O'Halloran et al., 2011) | Qualitative Study     | Hospital Stroke Units | Acute stroke patients                  | 65 patients  | Direct observation              | Facilitators and barriers to communication                 | Hectic hospital environment, presence of critically ill patients, lack of privacy, noise |
| Jain & Krieger (Jain & Krieger, 2011)       | Qualitative study     | Hospital              | International medical graduates (IMGs) | 12 graduates | In-depth interviews             | Effective strategies to overcome communication differences | Anxiety, low self-esteem, and unfamiliarity with medical procedures                      |

|                                               |                       |              |                                                                    |                                                   |                                            |                                                                  |                                                                                                                    |
|-----------------------------------------------|-----------------------|--------------|--------------------------------------------------------------------|---------------------------------------------------|--------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| Norouzinia et al. (Norouzinia et al., 2015)   | Cross-sectional study | Hospital     | Nurses and patients                                                | 70 nurses and 50 patients                         | Questionnaires                             | Perceived communication barriers                                 | Poor patient education and lack of understanding                                                                   |
| Stans et al. (Stans et al., 2018)             | Qualitative study     | Institutions | Healthcare professionals and communication with vulnerable clients | 22 (11 observations and 11 interviews)            | Observation and semi-structured interviews | Adaptation in communication strategies                           | Linguistic and cultural differences                                                                                |
| Armstrong et al. (Armstrong et al., 2019)     | Qualitative analysis  | University   | Neurologists, care partners, patients                              | 60 (20 patients, 20 care partners, 20 physicians) | Semi-structured interviews                 | Barriers and facilitators to effective communication             | Time pressure is the most significant barrier                                                                      |
| Al-Kalaldeh et al. (Al-Kalaldeh et al., 2020) | Cross-sectional study | Hospital     | Emergency nurses                                                   | 199 nurses                                        | Questionnaire                              | Perceived barriers and differences between demographic subgroups | Overwork, shortage of nurses, lack of time, unwillingness to communicate, lack of understanding of patients' needs |

|                                          |                        |                             |                                           |                               |                                  |                                                  |                                                                                                 |
|------------------------------------------|------------------------|-----------------------------|-------------------------------------------|-------------------------------|----------------------------------|--------------------------------------------------|-------------------------------------------------------------------------------------------------|
| D'Souza et al.<br>(D'Souza et al., 2021) | Qualitative study      | Hospital                    | Doctors, nurses, allied health care staff | 58 professionals              | Interviews and focus groups      | Effectiveness of communication strategies        | Anxiety, discomfort, lack of awareness about nurses' duties, and interference by family members |
| Heard et al.<br>(Heard et al., 2022)     | Qualitative research   | Acute Stroke Unit           | Nurses and patients with aphasia          | 5 nurses and 6 patients       | Focus groups and interviews      | Effective communication and healthcare outcomes  | Lack of nurses, excessive noise, lack of privacy, and time constraints                          |
| Albahri et al.<br>(Verulava, 2023)       | Cross-sectional survey | Primary Healthcare Centres  | Family physicians                         | 1122 patients, 170 physicians | Self-administered questionnaires | Feasibility and implementation of communications | Bias toward English-speaking patients, lack of cultural competency                              |
| Lee et al. (Lee et al., 2024)            | Qualitative study      | Hospital and Clinical Setup | Palliative care physicians                | 16 family physicians          | Semi-structured interviews       | Barriers from patient and physician perspectives | Physicians struggle with translation and reliance on family members for interpretation.         |

### **Participant and outcome measure characteristics**

As shown in Tables 4.3, the reviewed studies had diverse healthcare professionals, including nurses, doctors, neurologists, and international medical graduates (IMGs). Some studies also included patient perspectives, providing a more holistic view of communication dynamics. The studies reviewed identify several key barriers for effective communication between healthcare professionals and patients. Cultural differences, patient education, workload, emotional distress, language, unfamiliarity with local medical practices, and self-esteem issues were major barriers that often led to misunderstandings and healthcare beliefs.

27 Probing questions were made using the above-mentioned barrier (Appendix 1). Probing questions were divided into two sections: Section 1 contained introductory questions targeted at eliciting information on years of experience and the range of case exposure in general, whereas Section 2 focused on communication barriers.

The analysis of semi-structured interview data from 6 HCPs identified 56 subthemes across 8 main themes under the global theme “Perceived barriers of health care professionals and the developed themes were: communication breakdown, time-work-related barriers, emotional and psychological barriers, comorbidity-related barrier, awareness and knowledge-related barriers, demographic, environmental, and other barriers. These themes highlight the difficulties healthcare professionals face in treating stroke patients. The summary of generated units, codes, sub-themes, and themes is shown in Table 4.4.

**Table 4.4**

*Summary of themes and sub-themes, along with examples of codes and meaningful units*

| <b>Themes</b>                                    | <b>Subthemes</b>                                                  | <b>n</b> | <b>Examples of code</b>                                 | <b>Examples of meaningful units</b>                                                                                   |
|--------------------------------------------------|-------------------------------------------------------------------|----------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Perceived barriers</b>                        |                                                                   |          |                                                         |                                                                                                                       |
| <b>Theme-1:<br/>Communication<br/>Breakdowns</b> | <b>Language impairment:</b><br>Comprehension & expression deficit | 3        | Failure in initiating communication.<br>Broken sentence | Find it difficult to seek help or to express their discomfort                                                         |
|                                                  | Cognition Level of the Patient                                    | 3        | Fail to grasp<br>Losing words                           | Patients find it difficult to regain their orientation<br>Patients say 'chair' for 'table.'                           |
|                                                  | Memory impairments                                                | 1        | Recall<br>Forget                                        | Patients show frustration at the inability to recall.<br>They want frequent reminders                                 |
|                                                  | Reduced Attention and Processing<br>Speed of understanding        | 3        | Attention breaks<br>Long pause                          | The time gap between my question and their initiation of an answer                                                    |
|                                                  | Lack of patience and active listening                             | 3        | No patience                                             | Sometimes, patients will not have the motivation to listen and participate in communication, even if they listen, the |
|                                                  | Misinterpretation of the questions asked by the profession        | 1        | Rephrase                                                |                                                                                                                       |
|                                                  | Terminologies Used by Healthcare Professionals                    | 2        | Synonyms                                                | Suddenly, I find it difficult to get synonyms for medical terminologies                                               |
|                                                  | <b>No verbal response</b>                                         | 1        | Use of gestures                                         | Through the use of gestures, eye contact, or facial expression, patients try to clarify                               |
|                                                  | Misinterpretation of non-verbal cues                              | 2        | Misinterpret                                            | Difficult to encode their gesture, we misinterpret their gesture                                                      |

|                                                                  |                                                             |   |                                                               |                                                                                                                                                                                 |
|------------------------------------------------------------------|-------------------------------------------------------------|---|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                  | Long, complicated instructions                              | 1 | Difficult to follow instructions                              | They even find it difficult to understand simple sentences, follow 1-2 instructions                                                                                             |
| <b>Theme 2:<br/>Time and<br/>Workload Barriers</b>               | Time is a constraint                                        | 2 | Administrative work<br>Clinical work<br>Frequent interruption | It feels chaotic when frequently interrupted together by emergencies, phone calls, clinical, and administrative works and we don't get enough time to communicate with patients |
|                                                                  | Shortage of professionals                                   | 1 | Lack of training<br>Task-oriented                             | Fewer staff, and even if they are not specifically trained for stroke.<br>More than communication, we focus on treatment.                                                       |
|                                                                  | Increased caseload                                          | 1 | More number of cases                                          | The workload doesn't allow us to encourage or motivate the patient. We rush the basic case history                                                                              |
|                                                                  | Overwork time                                               | 1 | Burnout                                                       | In a double shift, unpredictable hours of work will lead to burnout and rushed care                                                                                             |
|                                                                  | Rushed Conversations due to hospital Workload               | 1 | Documentation                                                 | Due to the lengthy, mandatory recording of patients' data, there will be limited face-to-face interaction.                                                                      |
| <b>Theme 3:<br/>Emotional and<br/>Psychological<br/>Barriers</b> | Lack of motivation among patients and caretakers            | 2 | Hopelessness<br>Lack of support                               | The sense of hopelessness about the future will reduce the motivation level in patients. And sometimes they get anxiety or depression                                           |
|                                                                  | Stubborn behaviour among stroke patients                    | 1 | Resistant                                                     | Patients will be heavily resistant to lifestyle changes. They deny the condition                                                                                                |
|                                                                  | Mood and attitude of clinicians in making good observations | 1 | Change in attitude                                            | With years of experience, my empathy level is reducing, maybe due to repeated exposure to the same kind.                                                                        |
|                                                                  | Anxious & stressed                                          | 2 | Moral distress                                                | It feels stressful when I am unable to provide the best care                                                                                                                    |
|                                                                  | Patient avoids direct communication                         | 1 | Fear                                                          | Fear of being misunderstood                                                                                                                                                     |

|                                                                                                          |                                                               |   |                                                 |                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|---|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                          | Social withdrawal                                             | 1 | Embarrassment                                   | Patients intentionally avoid social situations out of fear of being misunderstood, which leads to embarrassment.                                                                      |
|                                                                                                          | Social stigma and Discrimination                              | 1 | Fear<br>Fear of failure                         | Initially, I feared being judged by superior professionals.<br>Patients will have the fear of failure due to the complexity involved in treatment, rehab, and the process of recovery |
| <b>Theme 4:<br/>Comorbidity-related barrier</b>                                                          | Comorbidities conditions                                      | 1 | Limited motor ability<br>Fatigue                | The patient cannot reach the people they need to speak to, which can sometimes create loneliness.                                                                                     |
|                                                                                                          | Sensory impairment                                            | 2 | Hearing loss<br>Visual impairment               | When a patient is already struggling to process language, their hearing loss will be more challenging to overcome, and to communicate effectively with them                           |
| <b>Theme 5:<br/>Awareness and knowledge related to communication barriers, strategies, and resources</b> | Lack of awareness of deficits                                 | 1 | Education on the condition and its consequences | We had learnt little in our clinical posting.<br>We don't realise that they are struggling; from the outside, they feel fine.                                                         |
|                                                                                                          | Lack of knowledge on communication skills among professionals | 1 | Knowledge and training                          | I haven't received any formal training as such<br>There should be a workshop on how to communicate with stroke patients                                                               |
|                                                                                                          | Lack of awareness among patients and caretakers               | 1 | Awareness                                       | Rural people are not aware of the available options for better rehabilitation                                                                                                         |
|                                                                                                          | Interprofessional coordination, limited access to SLP         | 2 | Coordination                                    | I am not sure about SLP's availability nearby.                                                                                                                                        |

|                                                       |                                                                                                         |   |                                    |                                                                                                                                                                |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Theme 6:<br/>Demographic-<br/>related barriers</b> | Lack of resources and limited access to information and resources related to speech-language disorders. | 4 | Resources                          | I try to converse in my own way, using simple words slowly, but I don't know how effective it is.                                                              |
|                                                       | Absence of picture boards or writing materials/tools to assess the individual                           | 2 | Tools                              | Mostly use gestures, I don't know what other aids can be used to communicate                                                                                   |
|                                                       | Inconsistent use of communication strategies/tools for assessment                                       | 2 | Utilization<br>Confidence          | I usually ask family members to help. I feel unsure while conversing                                                                                           |
|                                                       | Age factor                                                                                              | 1 | Difficult with older adults        | It's difficult to motivate older patients because they're easily inclined to feel that there's nothing left in life, and they don't attend sessions regularly. |
|                                                       | Gender difference                                                                                       | 1 | Female                             | I feel females from a rural background are less expressive                                                                                                     |
|                                                       | Low education level of the patient and the caretaker                                                    | 3 | Education                          | It is easy to counsel or to make educated patients understand their condition. Or it is difficult to make them understand the instructions.                    |
|                                                       | Culture difference                                                                                      | 2 | Norms                              | There will be little hesitation while conversing due to cultural norms.                                                                                        |
|                                                       | Language and dialect variation between professionals and patients                                       | 2 | Different levels of understanding. | Language and dialect variation will lead to different levels of understanding.                                                                                 |
|                                                       | Difficulty Translating Medical Terms into Regional Languages                                            | 2 | Translation                        | Counselling rural patients is difficult                                                                                                                        |
|                                                       | Language barriers- bilingualism                                                                         | 1 | Advantage                          | We need to learn the native language. If we had learnt many languages, its advantage for our profession.                                                       |
|                                                       | Professionals using different languages                                                                 | 1 | Language                           | It will be frustrating for both patients and professionals.                                                                                                    |

|                                                |                                                |   |                                     |                                                                                                                                                                                        |
|------------------------------------------------|------------------------------------------------|---|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                |                                                |   |                                     | I am from a different state with a different language. While taking the case history, I did find it difficult, but while counselling and consoling, it was                             |
|                                                | Religious difference                           | 1 | Hesitation                          | There will be little hesitation while conversing                                                                                                                                       |
|                                                | Socio-economic status                          | 2 | Poor and rural                      | Poor and rural people are hesitant to converse with us                                                                                                                                 |
| <b>Theme 7:<br/>Environmental<br/>Barriers</b> | Absence of Interpreter                         | 1 | educated caregiver                  | An interpreter will help overcome language barriers. We use an educated caregiver.                                                                                                     |
|                                                | Caretaker                                      | 2 | Act as both facilitator and barrier | A caregiver is important to facilitate, but when multiple caregivers attend an OPD consultation with varying levels of understanding, communication with the patient can become mixed. |
|                                                | Availability and Cooperation of Caretaker      | 3 | Family support                      | Family support is the most important aspect in treatment.                                                                                                                              |
|                                                | Background noise& distractions                 | 4 | Noise                               | In the ward, multiple caretakers generate additional background noise, creating disturbance.                                                                                           |
|                                                | Noisy ICU or General Ward Settings             | 4 | Noise                               | General wards will usually be noisy                                                                                                                                                    |
|                                                | Frequent Interruptions from Staff and Visitors | 3 | Frequent interruption               | We are often interrupted while communicating with patients                                                                                                                             |
|                                                | Ongoing Medications and Treatment              | 2 | Limits the interaction              | The patient feels drowsy, which limits the duration and chance for interaction.                                                                                                        |
| <b>Theme 8:<br/>Other barriers</b>             |                                                |   |                                     |                                                                                                                                                                                        |

*Note: 'n' indicates the number of participants*

After coding and **thematic analysis**, the semi-structured interview outcomes were validated. 56 questions were developed based on meaningful units, codes, and subthemes, and subjected to content validation.

### ***Content validation***

Items with a score of '2' were only considered for I-CVI calculation (Saiful & Yusoff, n.d.2019). The items with an I-CVI score of 0.8 or higher were retained and hence, the items (number of barriers) reduced from 56 to 31 (Appendix 3). To identify potential barriers, 31 finalized items were given to 50 healthcare professionals (7 doctors, 15 nurses, 13 physiotherapists, and 15 SLPs) for rating on a 5-point Likert scale (1-strongly disagree, 2-disagree, 3-neutral, 4-agree, and 5-strongly agree). Scores of strongly agree and agree were combined, and items meeting the 60% criterion were retained, as shown in Table 4.5. The figure 4.2 depicts the ratings of the 31 items by 50 HCPs. Items 15, 19, and 20 had scores below the 60% criterion (strongly agree and agree responses were combined and considered only for Phase 2) and therefore removed. Items 27 and 28 were merged into a single question; item no. 21 related to AAC was removed, since the material is exclusive of AAC, under the 6th and 8th themes, all the items rated less than 60% criterion, and hence removed; and the remaining 26 items under 6 themes were subjected to material development. 6 themes were referred to as 6 domains in the final material.

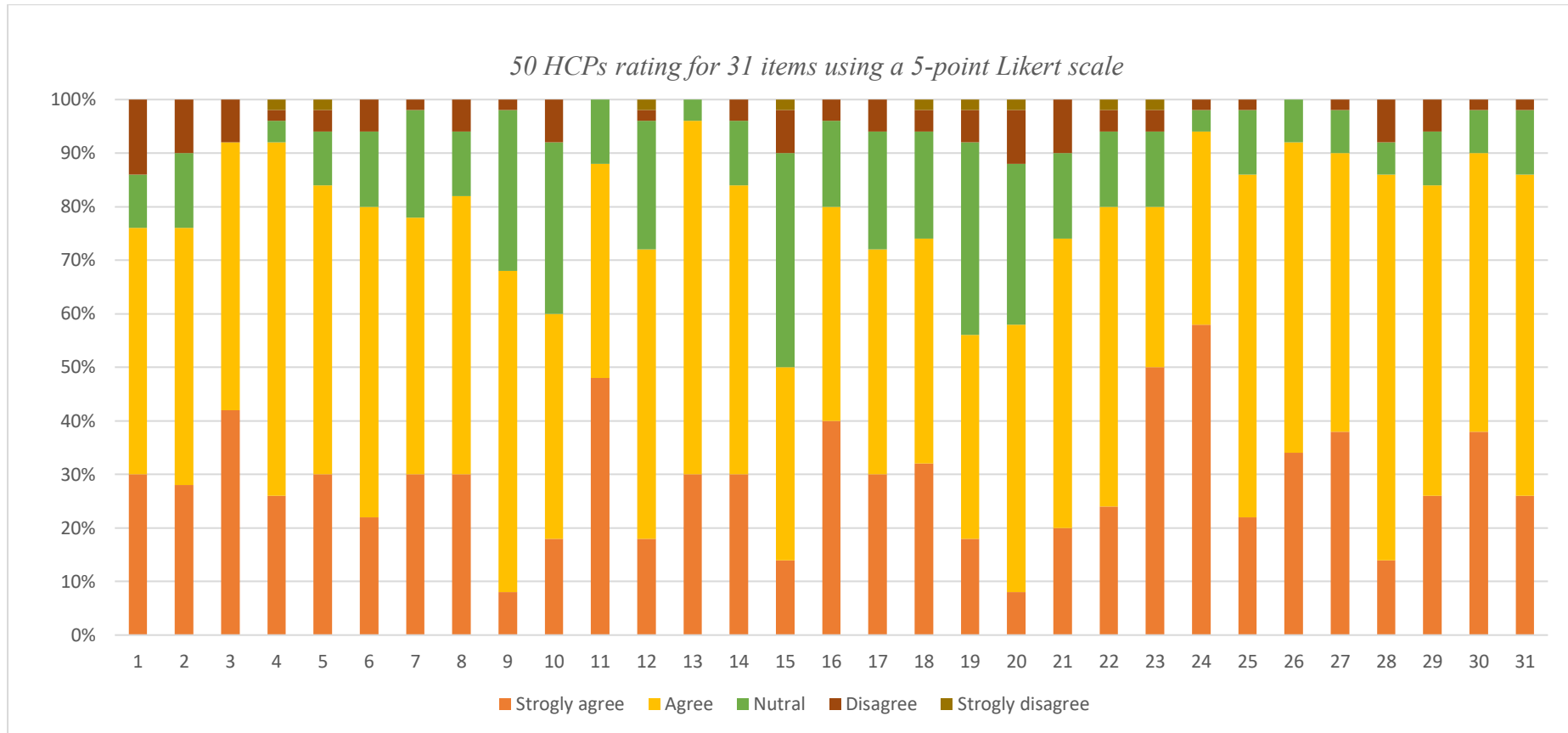
**Table 4.5***Content validation score*

| Question no | IN-A | I-CVI | UA | Question no | IN-A | I-CVI | UA |
|-------------|------|-------|----|-------------|------|-------|----|
| 1           | 7    | 0.77  | 0  | 29          | 5    | 0.55  | 0  |
| 2           | 7    | 0.77  | 0  | 30          | 7    | 0.77  | 0  |
| 3           | 7    | 0.77  | 0  | 31          | 8    | 0.88* | 0  |
| 4           | 7    | 0.77  | 0  | 32          | 8    | 0.88* | 0  |
| 5           | 8    | 0.88* | 0  | 33          | 8    | 0.88* | 0  |
| 6           | 9    | 1*    | 1  | 34          | 9    | 1*    | 1  |
| 7           | 9    | 1*    | 1  | 35          | 9    | 1*    | 1  |
| 8           | 8    | 0.88* | 0  | 36          | 9    | 1*    | 1  |
| 9           | 7    | 0.77  | 0  | 37          | 8    | 0.88* | 0  |
| 10          | 7    | 0.77  | 0  | 38          | 7    | 0.77  | 0  |
| 11          | 7    | 0.77  | 0  | 39          | 6    | 0.66  | 0  |
| 12          | 8    | 0.88* | 0  | 40          | 9    | 1*    | 1  |
| 13          | 9    | 1*    | 1  | 41          | 9    | 1*    | 1  |
| 14          | 9    | 1*    | 1  | 42          | 8    | 0.88* | 0  |
| 15          | 9    | 1*    | 1  | 43          | 7    | 0.77  | 0  |
| 16          | 9    | 1*    | 1  | 44          | 8    | 0.88* | 0  |
| 17          | 9    | 1*    | 1  | 45          | 7    | 0.77  | 0  |
| 18          | 9    | 1*    | 1  | 46          | 7    | 0.77  | 0  |
| 19          | 7    | 0.77  | 0  | 47          | 7    | 0.77  | 0  |
| 20          | 6    | 0.66  | 0  | 48          | 8    | 0.88* | 0  |
| 21          | 7    | 0.77  | 0  | 49          | 7    | 0.77  | 0  |
| 22          | 7    | 0.77  | 0  | 50          | 7    | 0.77  | 0  |
| 23          | 8    | 0.88  | 0  | 51          | 8    | 0.88* | 0  |
| 24          | 6    | 0.66  | 0  | 52          | 8    | 0.88* | 0  |
| 25          | 6    | 0.66  | 0  | 53          | 8    | 0.88* | 0  |
| 26          | 9    | 1*    | 1  | 54          | 9    | 1*    | 1  |
| 27          | 9    | 1*    | 1  | 55          | 9    | 1*    | 1  |
| 28          | 9    | 1*    | 1  | 56          | 8    | 0.88* | 0  |

Note: \* indicate CVI score > 0.8, IN-A= In agreement, UA= universal Agreement

Figure 4.2

HCPs rating for 31 items



*Note: Figure 4.2 depicts the 60% criteria to rate the 31 items using 5 point Likert scale by 50 HCPs, where the items with less than 60% were removed, and items scored above 60% were considered for the development of the material.*

## Phase 2

In the present study, Phase 2 focused on developing a resource material to address the communication barriers identified in Phase 1 by three experienced speech language pathologists and validated by another three SLPs.

### ***Resource Material and its possible domains:***

The title of the resource material is “Effective Communication with Stroke Survivors: A Manual for Allied Healthcare Professionals” and the same is shown in Appendix 4. The resource material was developed by collecting all the strategies and suggestions from three SLPs. The initial part of the resource material provides a brief overview of stroke conditions and the communication problems faced by individuals with stroke, followed by a list of common communication barriers faced by healthcare professionals, along with appropriate corresponding communication strategies to overcome these communication barriers. Barriers were divided into 6 domains; accordingly, barriers and appropriate strategies were listed along with the relevant line drawings. The list of barriers is presented in Table 4.6.

**Table 4.6**

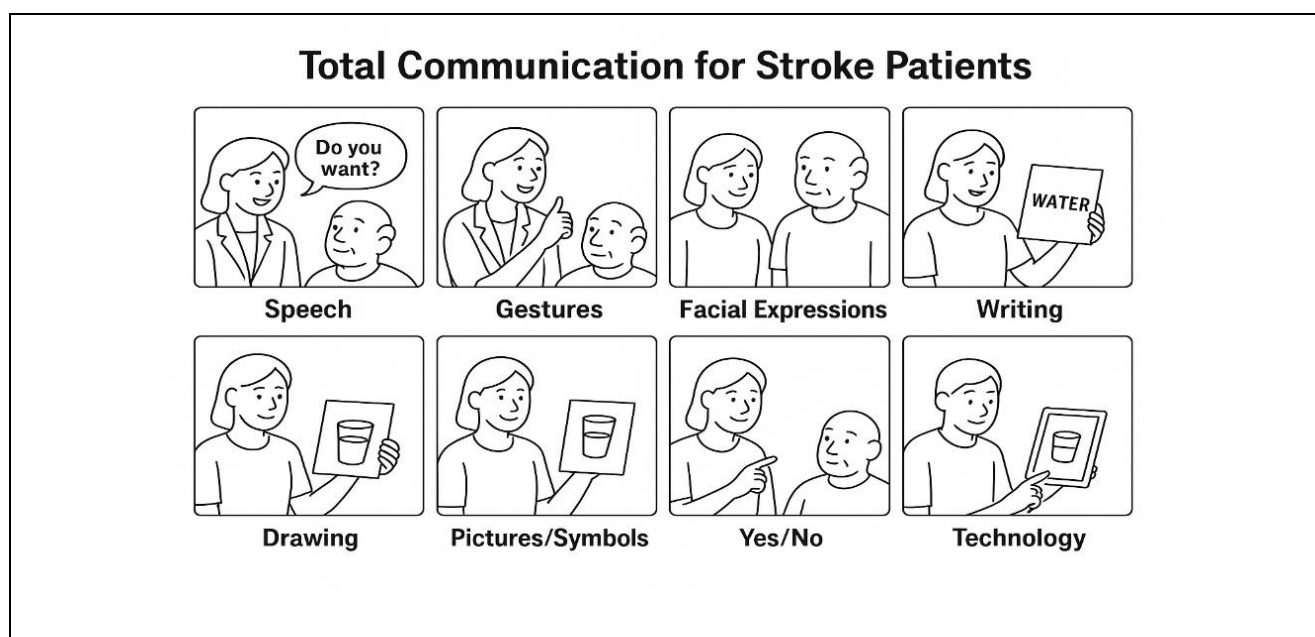
*List of barriers present in the material*

| Sl. No. | Domains- containing a list of barriers and strategies to overcome them   |
|---------|--------------------------------------------------------------------------|
| 1.      | Communication Breakdowns                                                 |
| 2.      | Environmental Barriers                                                   |
| 3.      | Time and Workload Barriers                                               |
| 4.      | Emotional and Psychological Barriers                                     |
| 5.      | Comorbidity-related barrier                                              |
| 6.      | Awareness and knowledge related to communication barriers and strategies |

The first barrier was to overcome the *communication breakdown* while communicating with stroke patients, and key strategies suggested by SLPs include giving the patient extended time or allowing the patient space to attempt a response, using simplified language, and structuring interaction around binary choice questions to respond. When comprehension is impaired, visual supports such as pointing to body parts or objects, simple drawings, and facial expressions help patients in expressing pain or needs. Gestures and demonstrations are also effective, particularly for patients with receptive language difficulties. Encouraging the use of preserved modalities, such as eye movements, gestures, or head nods, empowers patients to participate actively in communication despite speech limitations. Training families in basic supportive communication (e.g., speaking slowly, repeating key words, validating attempts) enhances outcomes. Ultimately, reducing communication breakdowns requires persistence, atonements to non-verbal cues, and an ongoing commitment to person-centered interactions.

*Figure 4.3*

*Strategies suggested to overcome communication breakdowns*

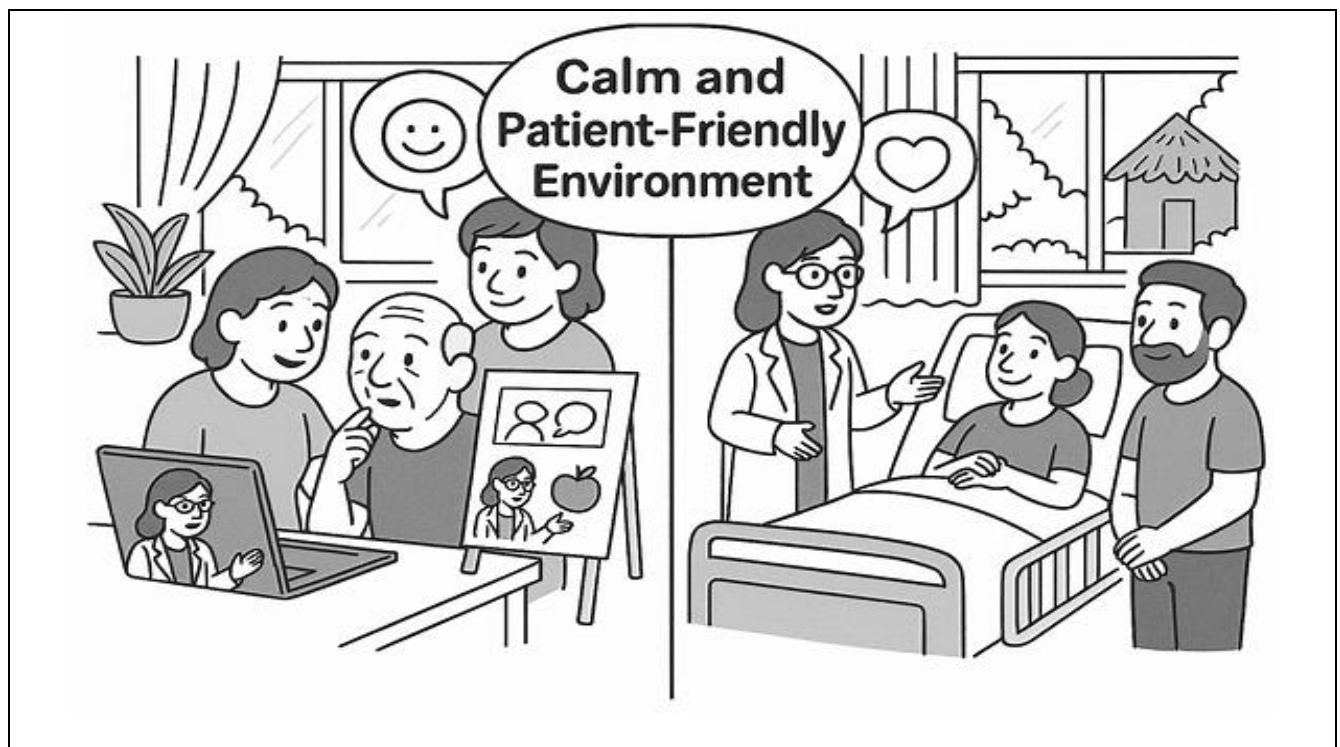


*Note: Figure 4.3 depicts the strategies suggested to overcome communication breakdowns: HCPs using total communication with stroke patients to ease the communication*

The second was to overcome *environmental barriers*, such as background noise, excessive lighting, and multiple simultaneous stimuli that could overwhelm a patient's processing capacity and impair their ability to communicate. Simple measures such as reducing auditory distractions (e.g., lowering television volume or background volume), ensuring face-to-face interactions, and maintaining eye-level posture positions can significantly improve communication efficacy. Speaking in calm, low-stimulation zones such as corners of the ward were all the key strategies suggested by SLPs to limit distractions.

*Figure 4.4*

*Strategy suggested to overcome environmental barriers*

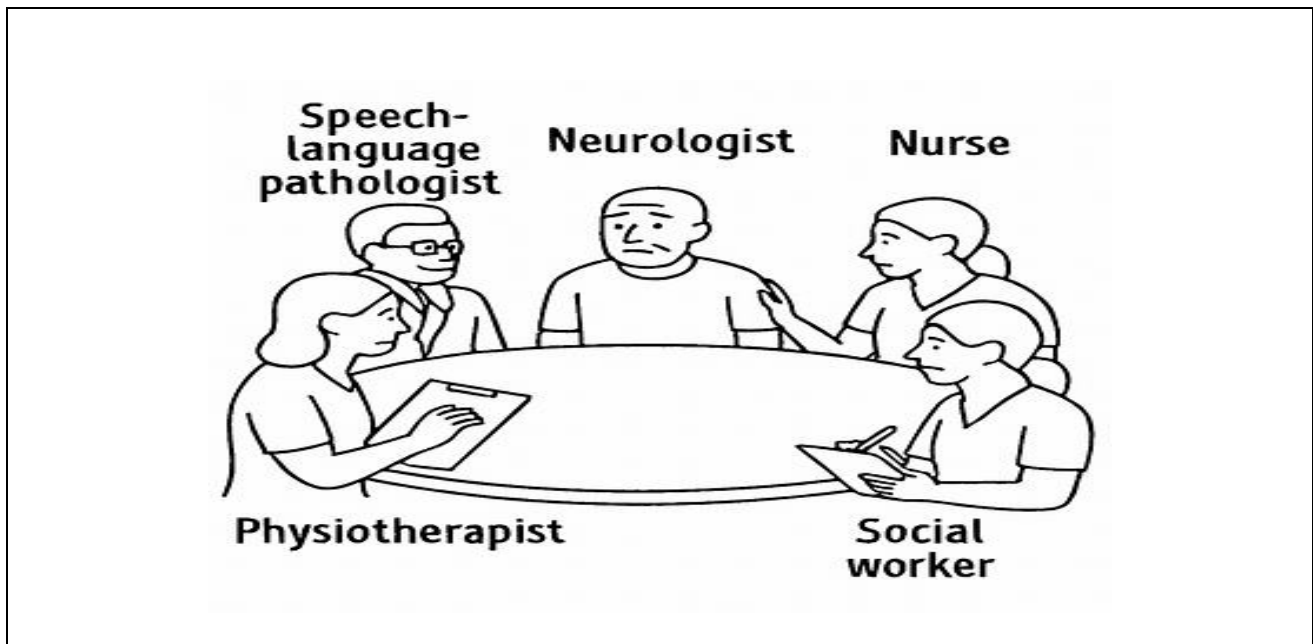


*Note: Figure 4.4 depicts the calm and patient-friendly environment, a strategy suggested to overcome environmental barriers*

The third barrier was to overcome the *time and workload barriers*, such as high patient loads and limited staffing, which may leave professionals rushing through essential conversations, leading to miscommunication or patient exclusion from decision-making. SLPs suggested the following strategies to address this: healthcare providers should integrate communication into routine care tasks. For example, conversations can take place during hygiene care or while administering medication, turning passive routines into interactive opportunities. Pre-scheduling short, focused interactions across the day (rather than relying on one lengthy exchange) ensures more effective information exchange while accommodating time pressure. These were all the key strategies suggested.

*Figure 4.5*

*Strategy suggested to overcome time and work-related barriers*

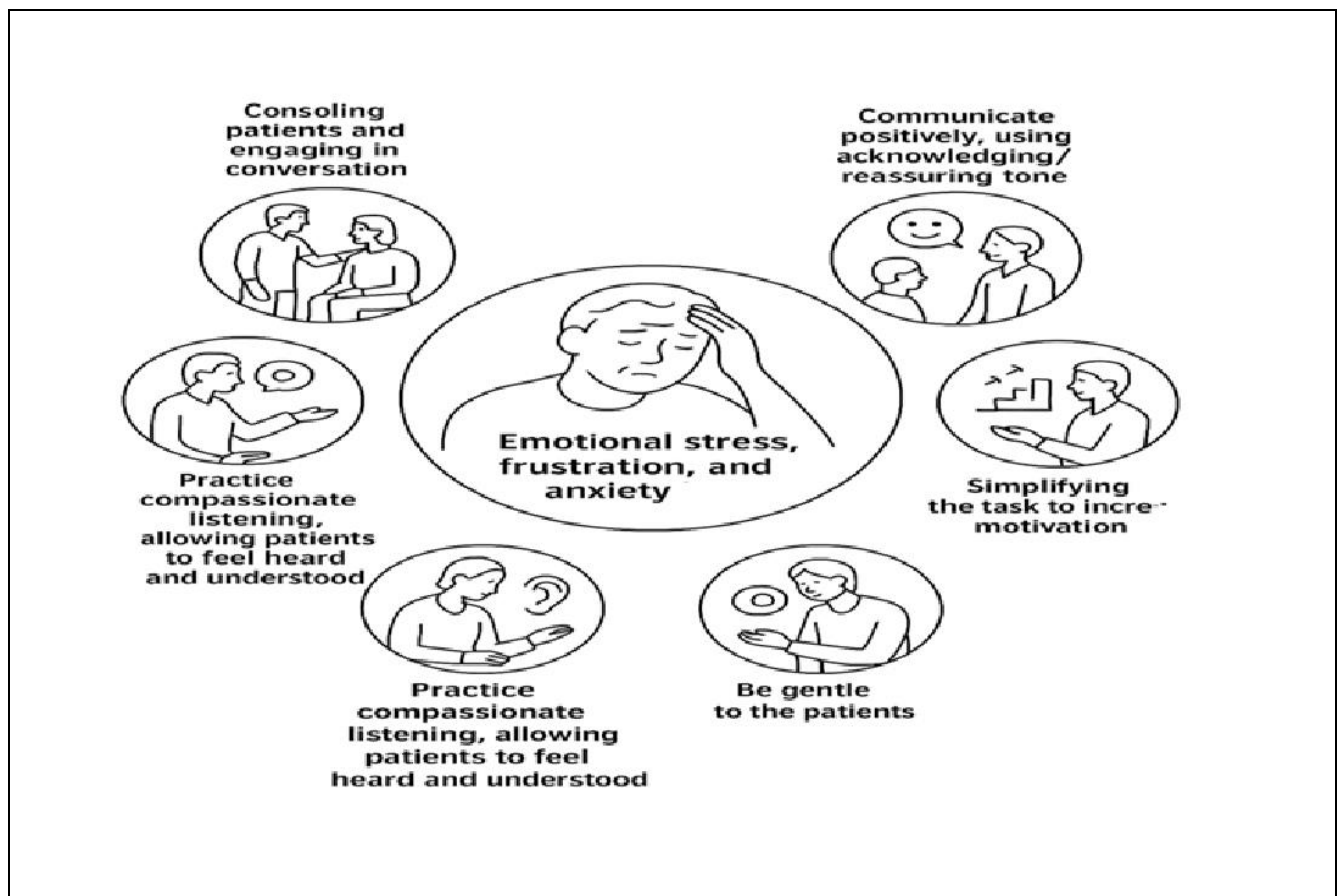


*Note: Figure 4.5 depicts the team approach, a strategy suggested to overcome time and work-related barriers*

The fourth barrier was to overcome the *emotional and psychological barriers*, such as the experience of depression, anger, denial, or withdrawal by the patient after a stroke. Healthcare professionals are suggested to recognize emotional distress not as resistance but as a valid response to loss and vulnerability. Compassionate listening, emotional validation, patience, using a calm tone, avoiding medical jargon, and creating a safe emotional space where the patient feels heard were all suggested to address emotional and psychological barriers.

Figure 4.6

*Strategies suggested to overcome emotional and psychological barriers*



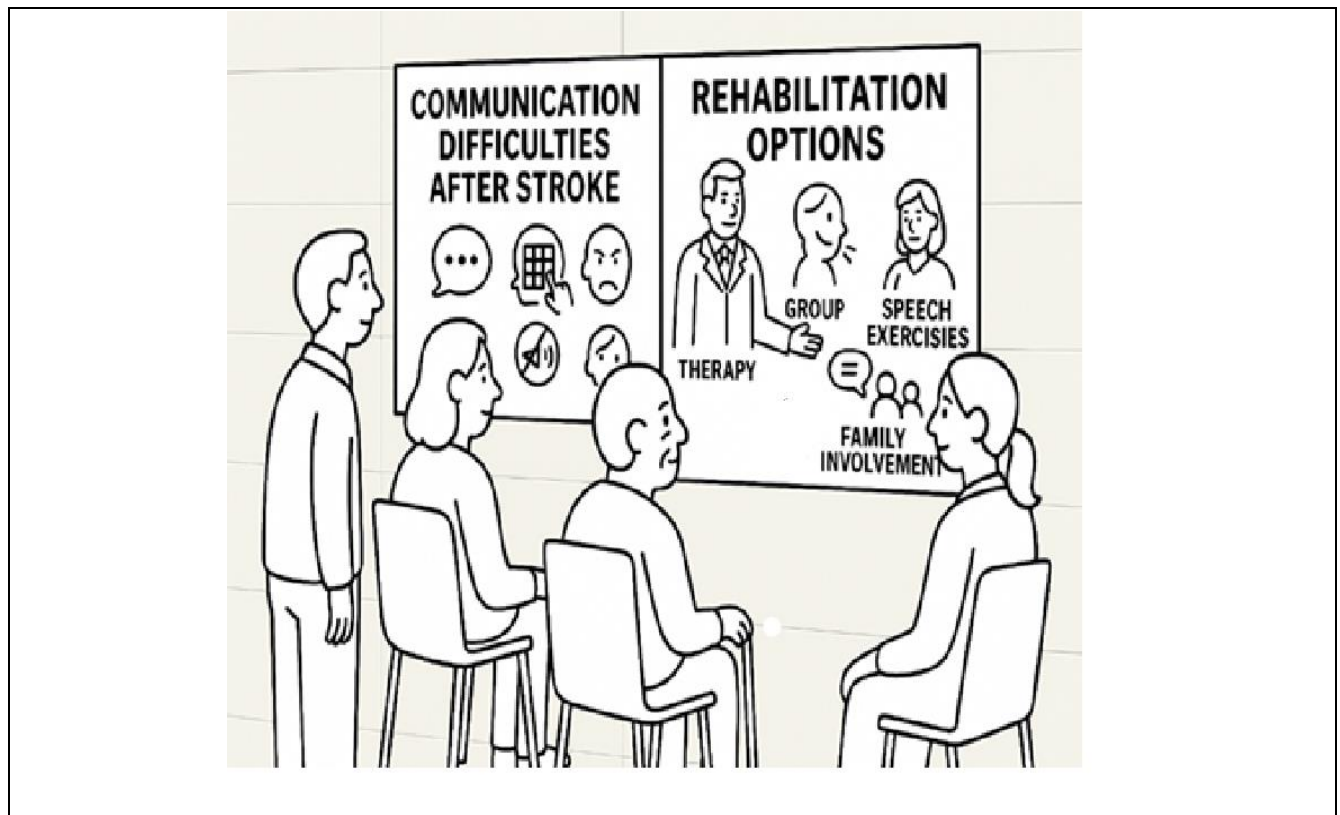
*Note: Figure 4.6 depicts the strategies suggested to overcome emotional and psychological barrier, such as consoling the patient and engaging in conversation, compassionate listening, being gentle, communicating positively using an acknowledging tone, and simplifying the task*

The fifth barrier was overcoming *comorbidities, such as, hearing, visual and other sensory impairments (Comorbidity-related barrier)*. The suggestion given was to ensure the hearing aids are used and also to use an optimized environment for clarity.

Lastly, strategies were suggested in order to overcome communication barriers related to *Awareness and knowledge*. To address these barriers, SLPs suggested developing educational pamphlets, pictorial tools, and professional awareness videos that emphasize communication difficulties, recovery possibilities, and the importance of early referral to speech-language pathology and rehabilitation services.

*Figure 4.7*

*Strategies suggested by SLPs to overcome awareness and knowledge-related barriers*



*Note: Figure 4.7 depicts the developed educational poster, strategies suggested by SLPs to overcome awareness and knowledge-related barriers*

The developed Material (Appendix 4) was reviewed by three SLPs. Table 4.7 depicts the rating for the resource material, and the following were the major suggestions provided by SLPs.

1. To rephrase long and ambiguous sentences for better understanding
2. To ensure consistent terminology throughout the material
3. To reduce the duplication of strategies and pictures
4. To insert a single SmartArt for more than four-line drawings to ensure better understanding
5. To correct grammatical typographic errors

**Table 4.7**

*Overall rating for the Resource material*

| Sl no              | Parameters            | Very poor | Poor | Fair | Good | Excellent |
|--------------------|-----------------------|-----------|------|------|------|-----------|
| 1.                 | Simplicity            | -         | -    | 2    | 1    | -         |
| 2.                 | Familiarity           | -         | -    | 1    | 2    | -         |
| 3.                 | Size of the picture   | -         | -    | 1    | 1    | 1         |
| 4.                 | Colour and appearance | -         | -    | 2    | 1    | -         |
| 5.                 | Presentation          | -         | -    | -    | 1    | 2         |
| 6.                 | Volume                | -         | -    | -    | 3    | -         |
| 7.                 | Relevance             | -         | -    | 1    | 1    | 1         |
| 8.                 | Accessibility         | -         | -    | 1    | 2    | -         |
| 9.                 | Flexibility           | -         | -    | -    | 2    | 1         |
| 10.                | Trainability          | -         | -    | -    | 2    | 1         |
| 11.                | Stimulability         | -         | -    | -    | 2    | 1         |
| 12.                | Generalization        | -         | -    | -    | 2    | 1         |
| (3 reviewers-SLPs) |                       |           |      |      |      |           |

### Phase 3

After incorporating the necessary suggestions into the material, a 10-MCQ questionnaire was developed. In addition, a confidence rating questionnaire was adopted, containing 10 items with a 4-point rating. The questionnaire was administered prior to and after the orientation (in the months of October and November 2025) to 15 participants, who were allied health professionals (7 physiotherapists, 1 doctor, 3 nurses, and 4 socio-medical workers) within the Mysore district, as shown in Table 4.8.

**Table 4.8**

*The number of HCPs who participated in the orientation program.*

| Sl. No.                         | HCPs                  | No of HCPs |
|---------------------------------|-----------------------|------------|
| 1.                              | Physiotherapists      | 7          |
| 2.                              | Nurses                | 3          |
| 3.                              | Socio-medical workers | 4          |
| 4.                              | Doctor                | 1          |
| <b>Total no of participants</b> |                       | <b>15</b>  |

The data obtained from the administration of both questionnaires, prior to and after the material's orientation, were subjected to statistical analysis to assess the effectiveness of the developed material. SPSS version 27 was used to perform the following statistical analyses.

The following criteria are used to discuss the phase 3 results:

- To check the effectiveness of the material by comparing the pre-test and the post-test scores of knowledge-based questionnaires.
- To check the effectiveness of the material by comparing the pre-test and the post-test scores of the confidence rating scale.

**A. To check the effectiveness of the material by comparing the pre-test and the post-test scores of knowledge-based Multiple Choice Questions.**

This section presents the responses of allied health care professionals for the knowledge-based test. There were 10 multiple-choice questions under this section; each correct response was recorded as '1', and wrong answers were recorded as '0'. Prior to analysis, the distribution of the response was tested for normality using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The result indicated that the data was not normally distributed ( $p=0.03$ ). Therefore, a non-parametric statistical method was used to describe and interpret the knowledge-based score in this section.

**Table 4.9**

*The number of correct responses on each question of HCPs in pre- and post-tests*

| Sl. No. | Questions                                                                                                                                                                                                         | Pre-test | Post-test |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|
| 1.      | Which type of question is most helpful in communication with stroke patients?                                                                                                                                     | 9        | 12        |
| 2.      | Stroke patients often hesitate to ask about their diagnosis. Which strategy can best encourage them to seek clarification?                                                                                        | 9        | 13        |
| 3.      | To ensure stroke patients comprehend treatment protocols, healthcare providers should:                                                                                                                            | 10       | 14        |
| 4.      | Stroke patients may forget hospital procedures easily. Which strategy is most effective in aiding their recall?                                                                                                   | 10       | 14        |
| 5.      | Which environmental modification can best reduce communication difficulties for stroke patients?                                                                                                                  | 12       | 14        |
| 6.      | Which method can healthcare providers adopt to ensure stroke patients in rural areas understand the importance of follow-up?                                                                                      | 13       | 14        |
| 7.      | Work-related pressures, such as tight schedules and staffing shortages, often make it difficult for HCPs to communicate effectively with stroke patients. Which strategy can help maintain communication quality? | 13       | 14        |
| 8.      | To prevent communication breakdowns due to limited time, healthcare teams should:                                                                                                                                 | 12       | 12        |
| 9.      | Hearing loss in elderly stroke patients often interferes with effective communication. Which strategy can best support understanding?                                                                             | 13       | 14        |
| 10.     | To improve communication outcomes for stroke patients in hospitals, healthcare teams should:                                                                                                                      | 11       | 13        |

*Note: HCP= Healthcare professionals*

The number of HCPs who answered correctly to each question in the pre- and post-test is given in Table 4.9, from which it is evident that the majority of HCPs scored lower on questions related to strategies for addressing communication breakdowns. In the post-test, which was administered 2 weeks after the orientation on the resource material, all the HCPs scored correctly for the majority of questions in all the domains. Table 4.9 also shows that for questions 6,7, and 9, most of the HCPs scored correctly in the pre-test itself which indicates that all the HCPs have good knowledge about overcoming barriers related to environmental modification, time, work-related aspects, handling co-morbidity, and psychological-emotional issues of stroke patients. However, the majority of questions related to communication breakdown as a barrier were answered incorrectly by HCPs. This confirms the present study's assumption that the HCPs have poor knowledge only with respect to communication strategies required to prevent communication breakdown with stroke patients.

Table 4.10 presents the descriptive statistics for each question and the overall total scores. No significant difference was observed in the median and inter-quartile scores of pre- and post-test scores which indicates that HCPs answered correctly for the majority of the questions.

**Table 4.10**

*Descriptive statistics of Knowledge-based Multiple Choice Questions (MCQs)*

|           | Median | Inter quartile |            | Median | Inter quartile |
|-----------|--------|----------------|------------|--------|----------------|
| PreQ1     | 1      | 1              | PostQ1     | 1      | 0              |
| PreQ2     | 1      | 1              | PostQ2     | 1      | 0              |
| PreQ3     | 1      | 1              | PostQ3     | 1      | 0              |
| PreQ4     | 1      | 1              | PostQ4     | 1      | 0              |
| PreQ5     | 1      | 0              | PostQ5     | 1      | 0              |
| PreQ6     | 1      | 0              | PostQ6     | 1      | 0              |
| PreQ7     | 1      | 0              | PostQ7     | 1      | 0              |
| PreQ8     | 1      | 0              | PostQ8     | 1      | 0              |
| PreQ9     | 1      | 0              | PostQ9     | 1      | 0              |
| PreQ10    | 1      | 0              | PostQ10    | 1      | 0              |
| Pre-total | 9      | 3              | Post-total | 10     | 0              |

Further, the McNemar test was used to describe and interpret the knowledge-based scores for individual items (1-10) in this section. Results indicate that no statistically significant difference in knowledge of HCPs is observed after the orientation, as shown in Table 4.11 and Figure 4.8.

**Table 4.11**

*Item-wise comparison of pre- and post-test scores for Knowledge-based Multiple Choice Questions*

| Questions          | N  | p     |
|--------------------|----|-------|
| pre q1 & post q1   | 15 | 0.375 |
| pre q2 & post q2   | 15 | 0.219 |
| pre q3 & post q3   | 15 | 0.500 |
| pre q4 & post q4   | 15 | 0.125 |
| pre q5 & post q5   | 15 | 0.500 |
| pre q6 & post q6   | 15 | 1.000 |
| pre q7 & post q7   | 15 | 1.000 |
| pre q8 & post q8   | 15 | 1.000 |
| pre q9 & post q9   | 15 | 1.000 |
| pre q10 & post q10 | 15 | 0.500 |

Figure 4.8

*Item-wise comparison for Knowledge-based Multiple Choice Questions (MCQs)*

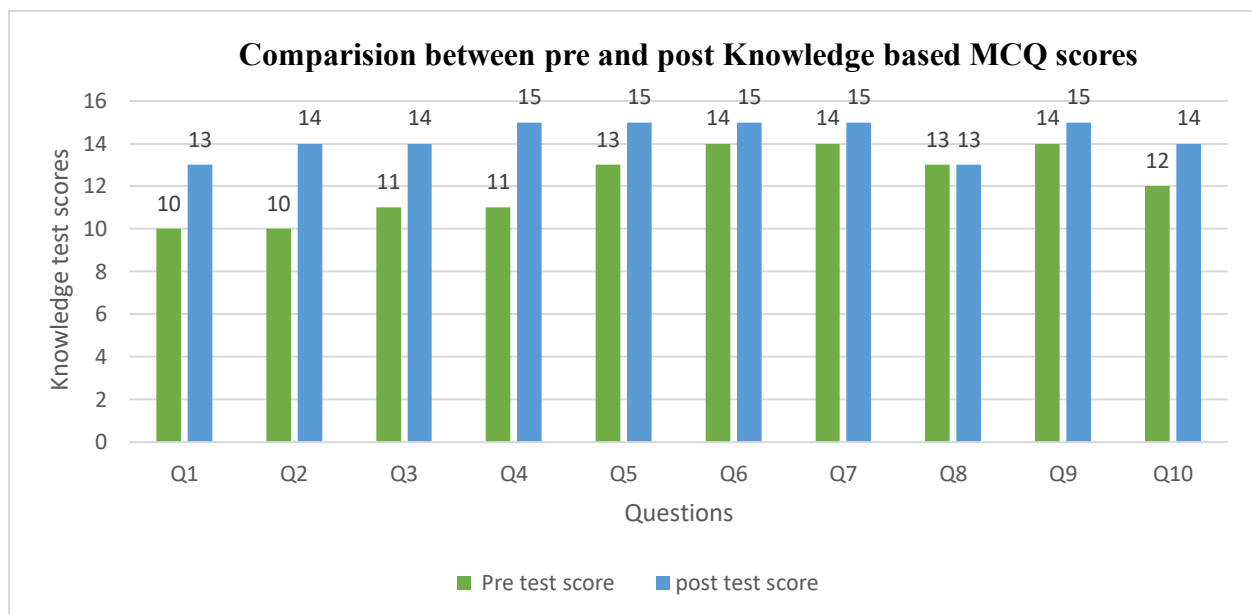


Figure 4.8 depicts a comparison of pre- and post-test scores for each item

Further, the Wilcoxon signed-rank test was used to assess the significance of the difference between the total pre-test and total post-test scores of the knowledge-based questionnaire, to assess overall improvement. The results indicate that knowledge (comparing total scores) on communication strategies for health care professionals was significantly higher after the orientation,  $Z [-2.971]$ ,  $p = [0.003]$ , as shown in Table 4.12 and Figure 4.9.

**Table 4.12**

*Comparison of the total scores between pre and post-Knowledge-based Multiple Choice Questions (MCQ)*

|                        | Z      | p      |
|------------------------|--------|--------|
| Post total - Pre total | -2.971 | 0.003* |

\*  $p \text{ value} > 0.05$

Figure 4.9

*Comparison of pre- and post-total test scores of the Knowledge based Multiple Choice Questions*

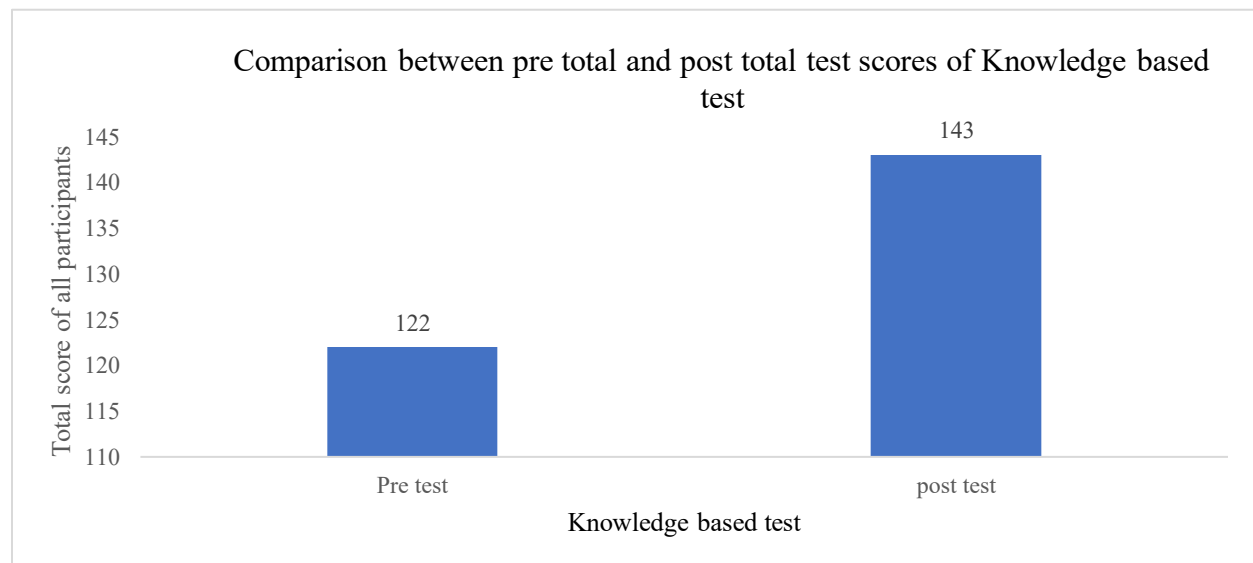


Figure 4.8 depicts the total scores of pre- and post- Knowledge based Multiple choice (MCQ)

**B. To check the effectiveness of the material by comparing the pre-test and the post-test scores of the confidence rating scale.**

This section presents the response of allied health care professionals for their confidence level in communication strategies used in evaluation, rehabilitation, or counselling stroke patients using the **confidence rating scale**. The scale had 10 items, and the responses were rated on a 4-point Likert scale, where ‘1’ indicated ‘not at all confident’ and ‘4’ indicated ‘very confident’. Prior to analysis, the distribution of the response was tested for normality using Kolmogorov-Smirnov and Shapiro-Wilk tests. The total score of the confidence rating scale for pre- and post-test was normally distributed ( $p > 0.05$ ) and therefore subjected to a paired t-test, whereas the individual items were not normally distributed ( $p > 0.05$ ) and hence, were subjected to Wilcoxon signed-rank test.

Table 4.13 presents the descriptive statistics of each item and the total confidence rating scale scores. The difference is noticed in the median scores for questions 3, 4, 5, 8, and 10. The median score increased post-test indicating an increase in the confidence level of participants (HCPs).

**Table 4.13**

*Descriptive statistics of the Confidence Rating Scale.*

|             | <b>Median</b> | <b>Inter quartile</b> |              | <b>Median</b> | <b>Inter quartile</b> |
|-------------|---------------|-----------------------|--------------|---------------|-----------------------|
| c pre q1    | 3             | 2                     | c post q1    | 3             | 1                     |
| c pre q2    | 3             | 2                     | c post q2    | 3             | 1                     |
| c pre q3    | 3             | 1                     | c post q3    | 4             | 1                     |
| c pre q4    | 3             | 2                     | c post q4    | 4             | 1                     |
| c pre q5    | 2             | 1                     | c post q5    | 3             | 1                     |
| c pre q6    | 3             | 1                     | c post q6    | 3             | 1                     |
| c pre q7    | 3             | 0                     | c post q7    | 3             | 2                     |
| c pre q8    | 3             | 1                     | c post q8    | 4             | 1                     |
| c pre q9    | 3             | 2                     | c post q9    | 3             | 1                     |
| c pre q10   | 3             | 2                     | c post q10   | 4             | 1                     |
| c pre total | 28            | 8                     | c post total | 34            | 9                     |

*Note: c is the confidence-related item rated by HCPs*

Table 4.14 illustrates a comparative analysis of participant confidence levels before and after the orientation program. The data revealed a substantial upward trend in self-reported confidence for all ten items of the confidence rating scale. Notably, the ‘Not at all confident’ rating was entirely eliminated post orientation, falling from a pre-orientation high of 13.3% (items 4, 5, and 9) to 0.0%. The majority of the HCPs rated themselves as moderately or very confident in the post-orientation test. This indicates the increased level of confidence in HCPs after orientation, suggesting the effectiveness of the orientation program.

**Table 4.14**

*Comparison of the Confidence Rating Scale of pre- and post- orientation across 10 items*

|              | <b>Not at all<br/>confident</b> |             | <b>Somewhat<br/>confident</b> |             | <b>Moderately<br/>confident</b> |             | <b>Very confident</b> |             |
|--------------|---------------------------------|-------------|-------------------------------|-------------|---------------------------------|-------------|-----------------------|-------------|
| <b>Items</b> | <b>pre</b>                      | <b>post</b> | <b>pre</b>                    | <b>post</b> | <b>pre</b>                      | <b>post</b> | <b>pre</b>            | <b>post</b> |
| 1.           | 6.7%                            | 0.0%        | 26.7%                         | 6.7%        | 40.0%                           | 53.3%       | 26.7%                 | 40.0%       |
| 2.           | 0.0%                            | 0.0%        | 13.3%                         | 6.7%        | 40.0%                           | 53.3%       | 26.7%                 | 40.0%       |
| 3.           | 0.0%                            | 0.0%        | 13.3%                         | 13.3%       | 46.7%                           | 53.3%       | 20.0%                 | 53.3%       |
| 4.           | 13.3%                           | 0.0%        | 40.0%                         | 0.0%        | 26.7%                           | 53.3%       | 46.7%                 | 66.7%       |
| 5.           | 13.3%                           | 0.0%        | 26.7%                         | 6.7%        | 40.0%                           | 53.3%       | 6.7%                  | 40.6%       |
| 6.           | 6.7%                            | 0.0%        | 26.7%                         | 6.7%        | 46.7%                           | 53.3%       | 20.0%                 | 40.0%       |
| 7.           | 0.0%                            | 0.0%        | 20.0%                         | 26.7%       | 60.0%                           | 40.0%       | 20.0%                 | 33.3%       |
| 8.           | 0.0%                            | 0.0%        | 6.7%                          | 6.7%        | 46.7%                           | 26.7%       | 46.7%                 | 66.7%       |
| 9.           | 13.3%                           | 0.0%        | 20.0%                         | 13.3%       | 26.7%                           | 40.0%       | 40.0%                 | 46.7%       |
| 10.          | 0.0%                            | 0.0%        | 26.7%                         | 6.7%        | 33.3%                           | 26.7%       | 40.0%                 | 66.7%       |

Further, a paired t-test was carried out to see the significant difference between the total pre-test score and total post-test score of the confidence rating scale. The result indicated that confidence level (comparing total scores) in using communication strategies for health care professionals was significantly higher after the orientation than before  $t = [-5.099]$ ,  $p = [0.000]$ , as shown in Table 4.15 and Figure 4.10.

**Table 4.15**

*Comparison of pre- and post-total test scores for the Confidence Rating Scale*

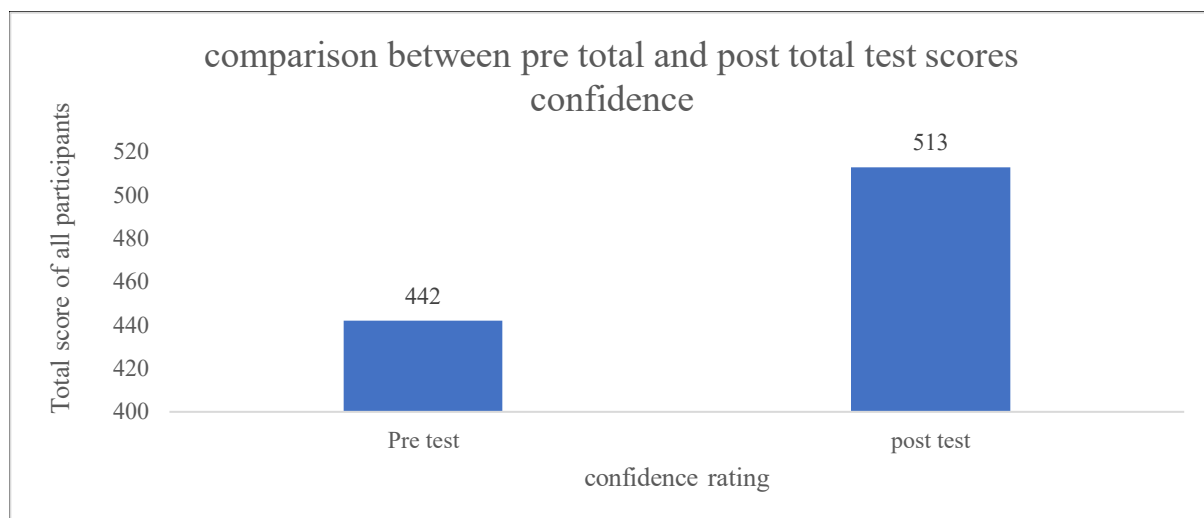
|                             | t      | df | sig    |
|-----------------------------|--------|----|--------|
| C pre total vs C post total | -5.099 | 14 | 0.000* |

*\*Indicate P value < 0.05*

To evaluate the overall efficacy of the orientation, total aggregate confidence scores were calculated for all the participants. As shown in Figure 4.10, the cumulative confidence score increased from a pre-test value of 442 to a post-test value of 513. This represents a significant positive shift in the participants' confidence. This is also supported by the data in Table 4.14 and suggests that the orientation provided a significant boost to the confidence level across all the measured domains.

Figure 4.10

*Comparison between pre-total and post-total test scores of the Confidence Rating Scale*



Further, the Wilcoxon signed-rank test was carried out to see the significant difference within the individual items of the confidence rating scale when comparing pre- and post-test scores. The result indicates that the confidence level of questions 1, 3, 4, 5, 6, 9 and 10 on using communication strategies for health care professionals was significantly higher after the orientation (Table 4.16 and Figure 4.11).

**Table 4.16**

*Comparison between pre- and post-test scores of the Confidence Rating Scale*

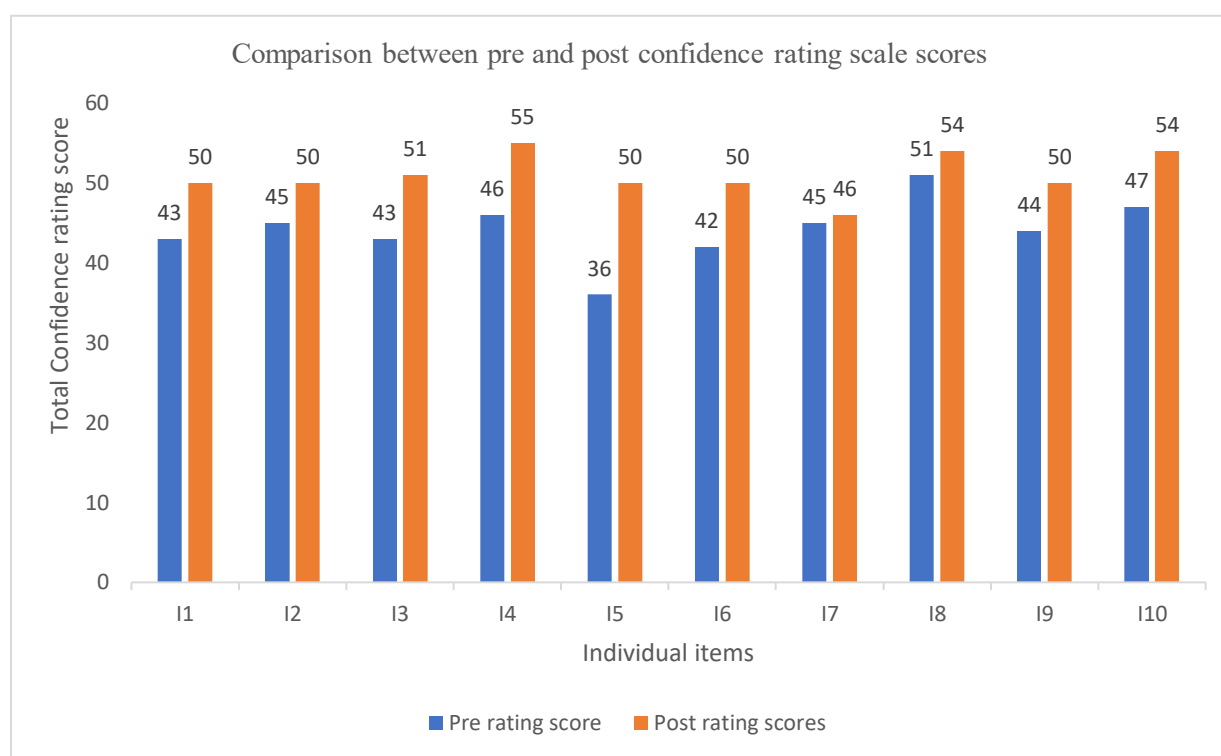
| Pre vs Post | Z                   | p      |
|-------------|---------------------|--------|
| Item 1      | -2.646 <sup>b</sup> | 0.008* |
| Item 2      | -1.518 <sup>b</sup> | 0.129  |
| Item 3      | -2.271 <sup>b</sup> | 0.023* |
| Item 4      | -2.460 <sup>b</sup> | 0.014* |
| Item 5      | -2.972 <sup>b</sup> | 0.003* |
| Item 6      | -2.309 <sup>b</sup> | 0.021* |
| Item 7      | -.302 <sup>b</sup>  | 0.763  |
| Item 8      | -1.000 <sup>b</sup> | 0.317  |
| Item 9      | -1.897 <sup>b</sup> | 0.058  |
| Item 10     | -2.333 <sup>b</sup> | 0.020* |

\*  $p \text{ value} > 0.05$

Figure 4.11 demonstrated a granular analysis of the ten individual items. Every item measured showed a positive post-test trajectory. Item 5 showed the most pronounced improvement compared to baseline, while item 8 reached the highest post-orientation score. Collectively, all the data across the results suggest that the content of the material and the orientation provided for HCPs addressed most of the targeted objectives.

Figure 4.11

*Item-wise comparison between pre- and post- scores of the Confidence Rating Scale*



*Figure 4.11 depicts a Comparison between pre- and post-confidence rating scale scores for each item.*

**Test-retest reliability:** A follow-up was conducted on the same participants (3/15) in Phase 3, 2 weeks post-orientation, using 10 MCQs to assess test-retest reliability. Good consistency was seen with a high interclass coefficient ( $>0.70$ ).

## CHAPTER 5

### DISCUSSION

The aim of the current study was to investigate the common communication barriers faced by allied health science professionals while communicating with Stroke patients and to develop a material for allied healthcare professionals to teach communication strategies that helps to overcome the identified communication barriers while communicating with individuals affected by stroke.

In Phase 1, a systematic review of 11 studies (including Sowney & Barr, 2007; O'Halloran et al., 2011; Jain & Krieger, 2011; Stans et al., 2018; Armstrong et al., 2019; D'Souza et al., 2021; Norouzinia et al., 2015; Al-Kalaldeh et al., 2020; Heard et al., 2022, among others) provided a strong evidence base highlighting key barriers in clinical communication. These findings were further used to develop probing questions for semi-structured interviews with six healthcare professionals, enabling an in-depth exploration of the communication barriers they faced. **Thematic analysis** of the qualitative data identified eight major themes and 56 subthemes reflecting multidimensional barriers to communication. Based on these findings, a questionnaire was developed to quantify the perceived barriers. The tool was validated by 50 healthcare professionals using a 5-point Likert scale, ensuring its content relevance and applicability. 26 items across six themes were finalized, representing the most significant barriers identified in both literature and clinical practice.

In Phase 2, a structured manual was developed to address these barriers, incorporating expert inputs from three SLPs and also validated by three SLPs. The present material consists of a list of 26 barriers, grouped into 6 domains. The following were the 6 domains:

- A. Communication breakdowns
- B. Environmental Barriers
- C. Time and Workload Barriers

D. Emotional and Psychological Barriers

E. Comorbidity-related barrier

F. Awareness and knowledge related to communication barriers and strategies

In the material, developed strategies were presented with appropriate line drawings, which were generated using Artificial Intelligence (Copilot) to enhance association, comprehension, and visualization of the situation wherever required. This material is unique in its own way in assisting HCPs to address the communication barriers and enhance the treatment for stroke patients. It helps reduce the burden on HCPs in easing the communication difficulty during both assessment and intervention.

The outcomes derived from the inputs of three speech-language pathologists (SLPs) highlighted the following strategies. To address communication breakdowns, the SLPs suggested providing extended response time, encouraging patients to attempt responses, using simplified language, and structuring interactions with binary-choice questions. For environmental barriers, they recommended reducing background noise, ensuring face-to-face interactions, maintaining eye-level positioning, and conducting conversations in low-stimulation areas. In relation to time and workload constraints, the SLPs proposed integrating communication into routine care activities and scheduling short, frequent interactions throughout the day. To overcome emotional and psychological barriers, they emphasized compassionate listening, emotional validation, patience, the use of a calm tone, and avoidance of medical jargon to create a supportive environment. For comorbidities -related barriers, they highlighted the importance of ensuring the use of hearing aids and optimizing the environment for better clarity. Furthermore, to address barriers related to lack of awareness and knowledge, the SLPs suggested the development of educational materials such as pamphlets, pictorial aids, and awareness videos, along with promoting early referral to speech-language pathology services. Overall, these

findings reflected a comprehensive and practical approach to improving communication with stroke patients in clinical settings.

### ***Strategies to Overcome Communication Breakdowns***

In the current study, HCPs reported difficulties in addressing communication breakdowns with appropriate communication strategies. It was difficult for HCPs to address patients whenever stroke patients found it difficult to express their pain and needs, and a similar report was found in the study conducted by Wylie and colleagues. Due to communication impairment in the patient, HCPs found difficulty explaining their diagnosis, treatment plan, and making lifestyle modifications. It is also difficult to frequently remain and repeat instructions and information during hospital procedures. Most of the time, HCPs rely on family members to elicit symptoms. The current study made a novel attempt to suggest key strategies, such as giving patients extended time or allowing patients, space to attempt a response, using simplified language, and structuring interactions around binary-choice questions to respond. When comprehension is impaired, visual supports such as pointing to body parts or objects, simple drawings, and facial expressions help patients in expressing pain or needs. Gestures and demonstrations are also effective, particularly for patients with receptive language difficulties. Encouraging the use of preserved modalities, such as eye movements, gestures, or head nods, empowers patients to participate actively in communication despite speech limitations. Training families in basic supportive communication (e.g., speaking slowly, repeating key words, validating attempts) enhances outcomes. Ultimately, reducing communication breakdowns requires persistence, attention to non-verbal cues, and an ongoing commitment to person-centered interactions.

### ***Strategies for Environmental Barriers***

The finding of the current study implies that lack of awareness of strategies to modify the environmental barriers, presence of multiple caregivers with their mixed level of understanding along with patient and caretakers cultural and educational background had an impact on effective communication and acted as environmental barriers and similar barriers were noticed in many studies (Brandenburg, 2017; Karlsson et al., 2010; Steele et al., 2011; Weaver, 2010). Reducing auditory distractions (e.g., lowering television volume/background volume), ensuring face-to-face interactions, and maintaining eye-level positioning can significantly improve communication efficacy. Speaking in calm, low-stimulation zones, such as corners of the ward were the key strategies suggested. Collaboration with the local hospital and tele practice was suggested for rural people. Awareness programs, camps, development of pamphlets, videos, and posters on social platforms were also recommended to educate the people.

### ***Strategies for Time and Workload Barriers***

Time and workload barriers, such as limited time for interaction, high patient loads, and limited staffing, led professionals to rush through essential conversations, leading to miscommunication or patient exclusion from decision-making. This finding was supported by earlier studies of Hemsley et al. (2012), Moore et al. (2013), and Stans et al. (2019). In the current study, all participating SLPs proposed a team approach to overcome time-related obstacles stating that it took more time for one patient to consult four or five HCPs than for numerous individuals to see all necessary professionals in one location. Both patients and professionals can benefit from it. Contrastingly, according to Heard et al. (2022), HCPs' time constraints and workload issues make it challenging to convene a team for rehabilitation.

SLPs suggested the following strategies to address time and workload barriers: A) healthcare providers should integrate communication into routine care tasks. For example, conversations can take place during hygiene care or while administering medication, turning passive routines into interactive opportunities. B) Pre-scheduling short, focused interactions across the day (rather than relying on one lengthy exchange) that ensured more effective information exchange while accommodating time pressure. C) Multidisciplinary, interdisciplinary coordination to avoid duplication and communication gaps, encouraging shift-based work and tele-rehabilitation, along with regular and frequent follow-ups. D) HCPs can be trained for preliminary stroke management. These were all the key strategies suggested.

### ***Strategies for Emotional and Psychological Barriers***

Identified emotional and psychological barriers, such as stubborn or resistant behaviour, emotional stress, frustration, and anxiety issues for stroke individuals, along with depression and social stigma associated with stroke, altogether had a negative impact on willingness to communicate with HCPs. Whereas in the studies by Bartlett et al. (2008), Park & Song (2005) highlight the psychological factors of HCPs, such as low self-esteem, negative attitude towards patients, despair, or apathy towards the profession. In the study conducted by Zamanzadeh et al. (2014), it was accentuated that, in addition to other factors, the psychological status of the HCPs may have an effect on the quality of care provided to the patient. The psychological factor of HCPs is not highlighted in our study; rather, the patient perspective was concentrated.

Healthcare professionals are suggested to recognise emotional distress not as resistance but as a valid response to loss and vulnerability. Compassionate listening, emotional validation, reinforcement, success stories, patience, using a calm tone, avoiding medical jargon, and creating a safe emotional

space where the patient feels heard were all the provided suggestions to address emotional and psychological barriers.

### ***Comorbidity-related barrier***

Among all sensory issues, hearing loss was the focus of all HCPs, despite vision and other sensory impairments that affected communication. The influence of elderly or post-stroke hearing impairment on the interaction between patient and professional was emphasized Purdy et al. (2016) wherein, they suggested ensuring use of the hearing aids and also an optimised environment for clear communication exchange.

### ***Awareness and knowledge related to communication barriers and strategies***

Lack of patient-friendly communication tools, structured training for HCPs, awareness of other professionals, especially SLPs across different setups were the barriers identified in the current study. To address these barriers, SLPs suggested developing educational pamphlets, pictorial tools, and professional awareness videos that emphasize communication difficulties, recovery possibilities, and the importance of early referral to speech-language pathology and rehabilitation services.

**To investigate the effectiveness of the material by comparing the pre-test and the post-test scores of knowledge-based questionnaires and confidence rating scale.**

Once the material was developed, an orientation program was conducted for fifteen allied health care professionals. Along with pre- and post-knowledge tests, the confidence level of the professional was also assessed before and after the orientation. From the pre-post test score comparison, it is

understood that the majority of HCPs scored less for questions related to strategies addressing communication breakdowns. In the post-test, most of the HCPs scored correctly for the majority of questions. Similarly, the confidence rating scale showed a significant difference, highlighted by the improved post-test scores and the consequent inference that the material helped all the HCPs to enhance their knowledge to overcome barriers related to communication breakdowns, environmental modification, time, work-related aspects, handling co-morbidity, and psych-emotional issues of stroke patients.

The following factors might have attributed to the findings. The material presented to the HCPs, a list of both barriers and strategies along with line drawings. However, each strategy in the material was projected and demonstrated to all HCPs in the orientation programme that lasted for two to three hours. HCPs were trained to use these strategies with the help of a material for the following two weeks. All these factors might have enhanced the knowledge on communication strategies and the confidence level of HCPs, and the findings addressed the research gap.

## **CHAPTER 6**

### **SUMMARY AND CONCLUSION**

Review of literature on consequences of stroke, such as aphasia, dysarthria, apraxia of speech, and cognitive communication disorder, suggests that there is a need to identify the barriers faced by healthcare professionals while communicating with stroke individuals. As communication specialists, SLPs need to develop a material to address the barriers HCPs face. Hence, the present study aimed to identify and address the barriers faced by HCPs. Also, there are no material for HCPs in the Indian context, and this study is the first to systematically explore communication barriers and facilitators.

The research was conducted in three phases. In Phase 1, a systematic review and a semi-structured interview were conducted to explore the barriers faced by allied healthcare professionals. 11 studies were systematically reviewed which helped summarize the barriers faced by HCPs. In addition, 56 barriers were identified through interviews with 6 experts. On compiling the interviewed information, a questionnaire was developed and validated by HCPs. Based on the rating of 50 HCPs, barriers were identified for the development of the material. In Phase -2, the material was developed based on the strategies and suggestions given by 5 SLPs. Barriers and strategies were arranged with relevant line drawings for content validation by three SLPs. Later in Phase 3, orientation programs were conducted for another group of allied healthcare professionals along with pre- and post-tests. The training period was for 2 weeks and the findings were subjected to statistical analysis.

To check the effectiveness of the material pre-post knowledge test, a confidence rating scale were given to HCPs who attended the orientation programs. The descriptive score of pre- and post-tests were analysed along with appropriate graphical representation. Median and interquartile scores across participation were considered. Further, a significant difference was noticed in pre- and post-test scores, and the material was found to be effective in enhancing the knowledge of the participants to overcome

the barriers related to communication breakdowns, environmental modification, time, work-related aspects, handling co-morbidity, and psycho-emotional issues of stroke patients.

### **Limitations of the present study**

Although the development of the material was well ventured to offer for a comprehensive tool, it may not satisfy all the communication needs of HCPs because of the heterogeneity of stroke conditions. The developed material was oriented only to 15 allied healthcare professionals. Future studies may increase the sample size to better generalise the strategies outlined in the current material. Pictures illustrated in the material are not original; they are generated using artificial intelligence.

### **Implications of the study**

- This is a novel study to systematically explore the communication barriers and facilitators.
- The findings of the study can help to reduce the burden of HCPs and facilitate better communication with patients.
- The presence of a well-structured material helped HCPs to increase their knowledge and awareness of different barriers and facilitators, and further ease their communication with stroke patients.
- The developed resource material may be useful to promote inter-professional education (IPE), which is an important approach to prepare UG and PG students for improved and effective communication with stroke patients.
- The material may also serve as a guide for caretakers.
- Strategies mentioned in the material can be generalised across settings.

### **Future directions**

The current study focused on identifying barriers and facilitators across a wide range of post-stroke conditions. Future studies may narrow down the barriers and facilitators to specific conditions, since different disorders exhibit different symptoms and features. It will furthermore be helpful for HCPs. Moreover, the material can be adopted in different Indian languages as a training module and used by HCPs across the country. To develop more effective strategies for improving healthcare communication, future research should adopt mixed-methods approaches and explore communication barriers beyond hospital settings. Further, translational research and policy evaluation are required to move into policy and practice strategies to help healthcare professionals overcome communication barriers while communicating with patients with communication disorders.

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## Appendices

### APPENDIX 1: Probing Questions developed for the semi-structured interview

#### Demographic details

Name:

Gender:

Language

Native language:

Language used with patients:

Profession:

|    |                                                                                                                                                                                                                                                                                             |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <b>Introductory questions:</b>                                                                                                                                                                                                                                                              |
| 1. | What are your experiences communicating with stroke-related communication disorders?                                                                                                                                                                                                        |
| 2. | For how many years have you been in practice?                                                                                                                                                                                                                                               |
|    | <b>Questions focusing on barriers:</b>                                                                                                                                                                                                                                                      |
| 3. | What stroke-related communication disorders have you encountered?                                                                                                                                                                                                                           |
| 4. | Have you ever faced difficulties while communicating with stroke patients?                                                                                                                                                                                                                  |
| 5. | What things are important to communicate to patients with stroke-related communication disorder?                                                                                                                                                                                            |
| 6. | What barriers have you come across while assessing or rehabilitating patients with respect to communication? Could you explain or list out?<br>a. Difficulty while taking the case history<br>b. Difficulty while giving tasks during assessment or making them understand the instructions |
| 7. | How do you make sure that they have understood the instruction?                                                                                                                                                                                                                             |
| 8. | What type of response do you elicit?                                                                                                                                                                                                                                                        |
| 9. | What strategies have you found to be helpful that make you, as well as your patient, comfortable during the medical interaction? (prompts: repeat, change voice inflections)                                                                                                                |

|     |                                                                                                                                                          |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10. | What techniques have you found to be helpful while interacting with patients with stroke-related communication? (prompts: prompting, cueing, modelling)  |
| 11. | What communication aids are you aware of?                                                                                                                |
| 12. | What resources are currently used to assist in communication with patients?                                                                              |
| 13. | How do you use those resources?                                                                                                                          |
| 14. | In what ways do you change the way you speak or behave to be liked more by your patient                                                                  |
| 15. | What are the ways you adopt so that patients identifies with you and become more comfortable with you during the discussion?                             |
| 16. | Have you attended any training program focusing on communication with patients?                                                                          |
| 17. | To what extent would you have benefited from a training program that focussed on communication with patients?                                            |
| 18. | If there is a training program, in your opinion, what are some of the main issues that such a program should address?                                    |
| 19. | What are some of the most important issues that need to be addressed in order to improve communication skills from a professional's perspective?         |
| 20. | Do you think demographic details such as age, gender, culture, and religious differences are a barrier to communication? If yes, how?                    |
| 21. | Do you think work-related factors such as shortage of professionals, overtime work, lack of time, and increased case load are barriers to communication? |
| 22. | Will the absence of family members affect the treatment?                                                                                                 |
| 23. | What is your comment on the biased or filtered translation of family members?                                                                            |
| 24. | Are professionals reluctant to hear patients' feelings and expressions?                                                                                  |
| 25. | Will the economic factor of professionals, such as, inadequate salary pay, be a barrier for communication with the patient?                              |
| 26. | Are you comfortable with a private ward or a mixed ward? Where do you think the barriers are more, and what barriers have you faced?                     |
| 27. | Have you experienced the feeling of being anxious or stressed about encouraging the patient to communicate?                                              |

## APPENDIX 2: Informed Consent Form

Identification/Sl. Number:

Date:

### INFORMED CONSENT

Name of the participant:

Profession:

Age/Gender:

Language:

### ABOUT THE STUDY

The project titled “Development of Resource Material to Reduce the Communication Barriers Faced by Allied Healthcare Professionals while Communicating with Stroke patients” is being carried out by Ms. Manasa, N., (Research officer, Department of Speech-Language Sciences, AIISH) under the guidance of Dr. K. Yeshoda (Associate Professor and Head, Department of Speech-Language Sciences, AIISH).

The purpose of this study is to document the common communication barriers faced by allied health science professionals while communicating with Stroke patients and to develop the resource material to address them. Upon agreeing to participate in this study, you will have to review each of the below-mentioned questions carefully which assess the communication barriers encountered by healthcare professionals when interacting with stroke patients. Kindly rate the questionnaire using the provided 5-point Likert scale below (1 - **Strongly Disagree**, 2 – **Disagree**, 3 – **Neutral**, 4 – **Agree**, 5 - **Strongly Agree**). Your participation in this study is purely voluntary and clinical information obtained in this regard will remain confidential.

### Informed Consent

I have been informed of the aims, objectives and procedures of the study. I am also aware that by subjecting to this investigation, I will have to give more time for assessment by the investigating team and that this assessment may not result in any benefits to me.

I, \_\_\_\_\_, the undersigned, give my consent for the participation in this study.

(AGREE/DISAGREE)

Signature of the Participant  
(Name and Address)  
Designation)

Signature of Investigator  
(Name and

### **APPENDIX 3: Perceived Communication Barriers in Stroke Care: Questionnaire for Healthcare Professionals**

#### **Instructions**

Dear Healthcare Professionals, please review each of the questions below carefully, which assess the communication barriers encountered by healthcare professionals when interacting with stroke patients. Kindly rate the questionnaire using the provided 5-point Likert scale below.

**(1 - Strongly Disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 - Strongly Agree)**

| <b>Sl.no</b> | <b>Items</b>                                                                                                                                                                                                                | <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|
| <b>1.</b>    | There is a limited awareness about speech-language therapy in India, making it harder for professionals to access appropriate communication breakdown.                                                                      |          |          |          |          |          |
| <b>2.</b>    | The inconsistent use of communication strategies/tools such as picture boards, gesture-based methods, or translated materials affects stroke assessment and rehabilitation in hospital setups for healthcare professionals. |          |          |          |          |          |
| <b>3.</b>    | The lack of patient-friendly communication tools, such as multilingual pamphlets, regional language videos, and culturally adapted visual aids, hinders effective communication between professionals and stroke patients.  |          |          |          |          |          |
| <b>4.</b>    | There is a lack of structured communication training for medical healthcare professionals to interact effectively with stroke patients.                                                                                     |          |          |          |          |          |
| <b>5.</b>    | Lack of speech and language pathologist in the hospital leads to communication difficult with stroke patients                                                                                                               |          |          |          |          |          |
| <b>6.</b>    | HCPs finds it difficult to communicate with stroke patients when they are not aware of its consequences on physical, speech, language, and cognitive deficits in post-stroke conditions                                     |          |          |          |          |          |
| <b>7.</b>    | HCPs finds it difficult to communicate due to Lack of awareness among patients and caretakers on                                                                                                                            |          |          |          |          |          |

|            |                                                                                                                                                                   |  |  |  |  |  |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
|            | resources or information about managing post-stroke physical disabilities.                                                                                        |  |  |  |  |  |
| <b>8.</b>  | Lack of awareness on speech and language rehabilitation for stroke patients with communication difficulties in hospital setup.                                    |  |  |  |  |  |
| <b>9.</b>  | HCPs often finds it difficult to communicate with stroke patients when they exhibit a lack of motivation during their rehabilitation process in a hospital setup. |  |  |  |  |  |
| <b>10.</b> | Leaving patients lonely in a ward hampered the communication abilities of the stroke individuals.                                                                 |  |  |  |  |  |
| <b>11.</b> | Hearing loss in elderly stroke patients makes communication difficult.                                                                                            |  |  |  |  |  |
| <b>12.</b> | Professionals Frequently encounter stubborn or resistant behaviour from stroke patients during rehabilitation or treatment.                                       |  |  |  |  |  |
| <b>13.</b> | Emotional stress, frustration, and anxiety in stroke patients negatively impact their willingness to communicate with healthcare professionals.                   |  |  |  |  |  |
| <b>14.</b> | Depression and social stigma associated with stroke lead to reduced patient participation in medical discussions with healthcare professionals                    |  |  |  |  |  |
| <b>15.</b> | Many patients hesitate to ask questions due to a cultural tendency to view doctors as authority figures whose instructions should not be questioned.              |  |  |  |  |  |
| <b>16.</b> | Limited time for patient interaction with the health care professionals leads to communication breakdown with the professionals.                                  |  |  |  |  |  |
| <b>17.</b> | Conversations with stroke patients are often rushed due to the high patient load in hospitals.                                                                    |  |  |  |  |  |
| <b>18.</b> | Work-related pressures, such as tight schedules, and staffing shortages creates challenging situation for HCPSs to communication with stroke patients             |  |  |  |  |  |
| <b>19.</b> | Environmental factors, such as noise and distractions, affect communication with stroke patients.                                                                 |  |  |  |  |  |
| <b>20.</b> | Due to frequent interruptions from hospital staff, visitors, and other patients HCPs finds it difficult to communicate with stroke patients                       |  |  |  |  |  |
| <b>21.</b> | The presence of multiple caregivers (family members, home nurses, etc.) with different levels of                                                                  |  |  |  |  |  |

|            |                                                                                                                                                  |  |  |  |  |  |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
|            | understanding leads to mixed communication with the patient.                                                                                     |  |  |  |  |  |
| <b>22.</b> | Lack of awareness of strategies to modify the environmental barriers leads to communication difficulties with stroke patients.                   |  |  |  |  |  |
| <b>23.</b> | It is challenging for HCPs to get follow-ups and to communicate with rural people due to a lack of education or awareness about stroke recovery. |  |  |  |  |  |
| <b>24.</b> | Stroke patients from rural backgrounds are less likely to use assistive communication technology due to a lack of resources or knowledge.        |  |  |  |  |  |
| <b>25.</b> | Stroke patients often rely on family members to communicate their symptoms instead of speaking directly to healthcare providers.                 |  |  |  |  |  |
| <b>26.</b> | Communication impairments in stroke patients make it difficult for them to express the events leading to their hospitalization.                  |  |  |  |  |  |
| <b>27.</b> | Stroke patients are less likely to ask questions about their diagnosis due to communication difficulties                                         |  |  |  |  |  |
| <b>28.</b> | Stroke patients are less likely to comprehend the lifestyle changes or treatment, which acts as a communication barrier for HCPs                 |  |  |  |  |  |
| <b>29.</b> | Stroke patients often struggle to understand descriptions of what is happening or will happen during hospital procedures                         |  |  |  |  |  |
| <b>30.</b> | Stroke patients often find it difficult to seek help or to tell about their pain and discomfort to HCPs, due to their communication impairments. |  |  |  |  |  |
| <b>31.</b> | Stroke patients require frequent reminders or repetitions of information regarding hospital procedures to aid recall                             |  |  |  |  |  |

## **APPENDIX 4: Effective Communication with Stroke Survivors: A Manual for Allied Healthcare Professionals**

### **1. Introduction**

Communication is a basic component of quality healthcare delivery. For patients who have experienced an acute stroke, communication can become significantly impaired, and can further complicate the diagnosis, treatment, recovery, and emotional support. Effective interaction between healthcare professionals and stroke patients is not merely a matter of courtesy; it is a clinical necessity before assessment and management. The ability to understand the patient's needs and engage the patient in decision-making processes relies heavily on competent and compassionate communication with stroke patients.

This resource material titled “Effective Communication with Stroke Survivors: A Manual for Allied Healthcare Professionals” is designed as a practical, ward-side resource for use by various healthcare professionals, including nurses, physicians, and allied health staff who work directly with stroke patients. The unique emphasis of this manual is its focus on communication strategies that do not involve Augmentative and Alternative Communication (AAC) devices. While AAC tools can be valuable, they are not always immediately available to healthcare professionals or may not be suitable for all patients. Instead, this guide prioritizes naturalistic communication approaches that can be implemented in real-time.

The immediate period after a stroke is often chaotic and overwhelming for both patients and their families. The neurological damage caused by stroke can lead to various communication problems, such as aphasia (difficulty with language), dysarthria (difficulty with the speech subsystem), apraxia of speech, or cognitive-communication issues. Each of these conditions can greatly impair a patient's ability to express needs in communication, ask questions, or even understand basic information. Stroke survivors may also experience confusion, agitation, fatigue, or emotional distress, which further increases communication difficulties. In these

situations, healthcare providers need to adjust their communication styles in sensitive, thoughtful, and flexible ways.

This particular manual provides a framework for adaptation. The strategies that are outlined in this manual are based on practical behaviors and techniques. Strategies include recognizing non-verbal cues, initiating communication with a patient, asking questions to a patient, simplifying sentences, use of gestures and body language effectively that promotes non-verbal communication, and involvement of family members and caregivers in the communication process.

Moreover, this manual can be used for hospital care where the time is limited with high patient loads, shared spaces, and a range of staff competencies. In such settings, ideal conditions for communication in quiet environments and dedicated communication aides are rarely available. Therefore, this manual helps clinicians with techniques that are effective even when they are exposed to different barriers. It draws on interdisciplinary insights from various health care professionals when treating individuals with stroke.

Importantly, the strategies offered here are consistent with person-centered care. Stroke survivors often experience feelings of lost autonomy, dignity, and control over their bodies and situations when they are exposed to different barriers. One of the major areas that allows healthcare providers to re-establish a sense of respect is communication. Through careful, patient, and adept communication, clinicians can nurture more effective therapeutic relationships with the patient.

The manual will underscore the significance of repetition and consistency. It is important to view communication as an ongoing process instead of a single event and beneficial for stroke patients to be repeatedly exposed to the instructions of health care professionals in the hospitals. Information that a patient does not grasp or recall during a single discussion may be better understood when reiterated through several exchanges over one day or multiple days.

Another central theme in this guide is the proactive involvement of family members and caregivers. These individuals play a crucial role in interpreting the patient's behaviour, reinforcing communication strategies, and ensuring continuity of care after discharge. They are also essential sources of emotional support

and often understand the patient's preferences, expressions, and reactions more intimately than clinical staff. Empowering and educating families on how to communicate effectively with stroke patients can greatly enhance outcomes.

While much of the healthcare system emphasizes pharmacological, surgical, and rehabilitative interventions in stroke care, communication remains an underexplored yet equally critical domain. Poor communication has been linked to medication errors, unmet needs, emotional distress, and patient dissatisfaction. On the other hand, effective communication can reduce misunderstandings, foster compliance with care instructions, improve patient mood and morale, and even shorten hospital stays.

In constructing this manual, care was taken to ensure that strategies are adaptable to various hospital environments, whether in urban tertiary hospitals or rural district hospitals. Recognizing that cultural and language differences add another layer of complexity, the manual includes strategies that respect and respond to cultural diversity, regional dialects, and rural health disparities. Furthermore, the guide is inclusive of patients across age groups, literacy levels, and comorbidity profiles.

In conclusion, this manual is more than a set of communication tips; rather it is a set of statements of intent to prioritize the patients recovering from stroke. Healthcare professionals must act as communicators, collaborators, and advocates. By equipping clinicians with the knowledge and practical tools to overcome communication barriers, the quality of stroke care can be improved, thereby enhancing patient dignity and support for more holistic recovery outcomes.

## **2. Understanding Communication Challenges in Stroke**

Stroke can disrupt the intricate communication pathways in the brain, often resulting in profound impairments in how a person understands, processes, and expresses language. These impairments are not uniform; they vary widely depending on the location and extent of the neurological injury in the brain, the pre-stroke communication abilities of the patient, and co-existing conditions such as hearing loss, cognitive decline, or fatigue. Understanding these challenges is the first step toward adapting communication strategies that respect patient dignity and promote effective care in communication.

## **2.1 Types of Communication Impairments usually seen in Post-Stroke Individuals**

The most common communication disorders following a stroke include:

- Aphasia – A language disorder that affects the ability to speak, understand spoken language, read, or write. It may manifest as expressive difficulties (non-fluent aphasia), receptive difficulties (fluent aphasia), or a combination (global aphasia).
- Dysarthria – A motor speech disorder caused by weakened or uncoordinated muscles, leading to slurred speech. Comprehension is usually intact, which can be particularly frustrating for patients aware of their inability to articulate thoughts clearly.
- Apraxia of Speech – A disorder affecting the planning and sequencing of speech movements, resulting in inconsistent errors, hesitations, and difficulty initiating speech.
- Cognitive-communication impairments – Deficits arising from impaired memory, attention, reasoning, or executive function. Individuals with this condition may struggle with following conversations, staying on topic, or interpreting figurative language. It is crucial to recognize that these impairments may co-exist and evolve, especially in the early recovery period of the stroke condition. A patient may initially appear confused or uncooperative, but the root cause may be an undetected communication difficulty rather than cognitive or behavioral issues in these individuals.

## **3. Strategies to Overcome the Communication Barrier**

### **A. Strategies to Overcome the Communication Breakdowns**

Communication breakdowns are among the most critical challenges in acute stroke care. Many patients are unable to express their symptoms, ask questions, or comprehend medical information. The resulting frustration can compromise care quality and patient safety. Rather than relying on AAC devices only, healthcare professionals can apply tailored, low-resource strategies that build communicative bridges using everyday clinical interactions.

Key strategies include giving patients extended time to respond to the question asked by health care professionals, using simplified language, and structuring interactions around binary (yes/no) or forced-choice questions to respond. When comprehension is impaired, visual supports such as pointing to body parts or objects, simple drawings, and facial expressions help patients in expressing pain or needs. Gestures and demonstrations are also effective, particularly for patients with receptive language difficulties.

A common tendency among staff is to fill in the blanks for patients, which can suppress patient agency. Instead, clinicians should allow time to respond, provide opportunities to patients to attempt expression, acknowledging every effort, encouraging the use of preserved modalities, such as eye movements, gestures, or head nods, empowers patients to participate actively in communication despite speech limitations.

Family involvement is crucial here. Family members often recognize subtle expressions and patterns in the patient's behavior that may go unnoticed by staff. Their participation in conversations can bridge communication gaps and reinforce strategies consistently across settings. Training families in basic supportive communication (e.g., speaking slowly, repeating key words, validating attempts) enhances outcomes. Ultimately, reducing communication breakdowns requires persistence, attentiveness to non-verbal cues, and an ongoing commitment to person-centered interactions.

## **B. Strategies to Overcome the Environmental Barriers**

The hospital environment is frequently not conducive to effective communication, especially for stroke survivors with sensory or cognitive impairments. Environmental distractions such as background noise, excessive lighting, and multiple simultaneous stimuli can overwhelm a patient's processing capacity and impair their ability to communicate.

Modifying the ward environment does not always require structural change. Simple measures like reducing auditory distractions (e.g., lowering television volume/background volume), ensuring face-to-face interactions, and maintaining eye-level positioning can significantly improve communication efficacy. Speaking in calm, low-stimulation zones such as corners of the ward or with curtains drawn helps to limit distractions. Another critical element is consistency among care team members. High turnover or the presence of multiple caregivers unfamiliar with the baseline behaviour exhibited by the patient can result in mixed messages and misinterpretation. A shared communication log or care diary at the bedside can help the health care professional to document successful strategies and patient preferences.

Patients with visual or hearing impairments may benefit from clearly labelled visual aids (e.g., calendars, signs, illustrated boards about common needs) and from ensuring glasses and hearing aids are properly fitted and functional. Involving allied health teams such as occupational therapy and audiology may help in environmental adaptation. Creating a communication-friendly space fosters not only better understanding but also emotional security. Stroke patients often feel vulnerable and disoriented. An orderly, quiet, and attentive environment can serve as a powerful therapeutic tool.

### **C. Strategies to Overcome the Time and Workload Barriers**

The pace of inpatient care often imposes time constraints on communication. With high patient loads and limited staffing, professionals may find themselves rushing through essential conversations, leading to miscommunication or patient exclusion from decision-making. To address this, healthcare providers should integrate communication into routine care tasks. For example, conversations can take place during hygiene care or while administering medication, turning passive routines into interactive opportunities. Pre-scheduling short, focused interactions across the day (rather than relying on one lengthy exchange) ensures more effective information exchange while accommodating time pressure.

When possible, divide responsibilities: nurses may address daily care concerns, while physicians can concentrate on updates and decision-making. Creating structured time slots for patient updates, even a five-minute check-in, can improve continuity and reduce patient anxiety.

Empowering support staff, including nursing assistants, to engage in basic communicative support, such as confirming understanding or explaining tasks this can help distribute the communication load. Interdisciplinary coordination, including consistent handovers, ensures that communication efforts are not duplicated or missed.

Additionally, clinicians should be supported with training on prioritizing communication without extending their workload. This includes recognizing that slowing down, even briefly, can yield long-term efficiency by preventing confusion, errors, and repeated explanations.

#### **D. Strategies to Overcome the Emotional and Psychological Barriers**

Stroke is a life-altering event, and emotional turmoil often accompanies communication deficits. Patients may experience depression, anger, denial, or withdrawal. These reactions can reduce motivation to interact, compromise comprehension, or lead to apparent uncooperativeness. These are not merely psychological reactions; they are communication barriers in their own right.

Healthcare professionals should recognize emotional distress not as resistance but as a valid response to loss and vulnerability. Compassionate listening, emotional validation, and patience are essential. Using a calm tone, avoiding medical jargon, and creating a safe emotional space where the patient feels heard can reduce the tension and foster dialogue. Routine engagement in friendly, non-clinical conversations, asking about interests, and offering greetings helps to build rapport and trust. Simple positive reinforcement (e.g., acknowledging when a patient attempts to express themselves) can significantly boost confidence.

Referral to psychological support services are to be recommended when emotional states persist. However, day-to-day emotional support begins with the ward staff. For patients with apathy or low motivation, gentle encouragement, setting achievable communication goals, and celebrating small successes can improve engagement. Group-based therapy, where feasible, may also offer psychosocial benefits, allowing patients to share experiences and observe peer efforts in communication recovery.

### **E. Hearing, Vision, and Sensory Integration**

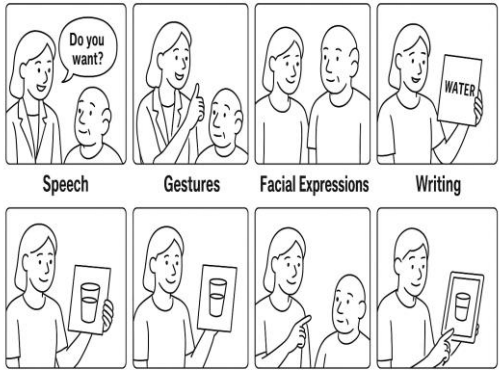
Hearing loss, visual deficits, and sensory processing disorders are common in stroke survivors, especially in older populations. These issues often go undetected but can profoundly impair communication. A patient who appears unresponsive might simply not hear clearly or may be visually misinterpreting the cues provided by the clinician. Ensuring that sensory aids (e.g., glasses, hearing aids) are used and that environments are optimized for clarity can prevent unnecessary confusion and improve interaction.

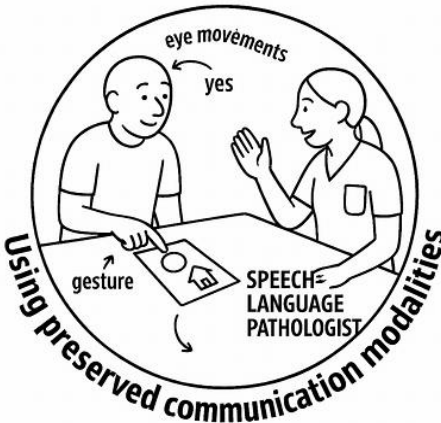
### **F. Awareness and knowledge related to communication barriers and strategies**

Awareness-related barriers often hinder effective management and rehabilitation of stroke patients, primarily due to limited knowledge among healthcare professionals about patients, the consequences of stroke and available rehabilitation services. To address these barriers, developing educational pamphlets, pictorial tools, and professional awareness videos can play a crucial role in disseminating information in a simple and accessible format. Such materials should emphasize communication difficulties, recovery possibilities, and the importance of early referral to speech-language pathology and rehabilitation services. Organizing periodic training programs, workshops, and community camps for both healthcare professionals and patients can further enhance awareness about available treatments, tools, and appropriate referral pathways. Additionally, recruiting multidisciplinary professionals into stroke care teams and integrating stroke communication and rehabilitation modules into medical, nursing, and allied health curricula can ensure sustained awareness, better inter-professional collaboration, and improved quality of care for stroke survivors.

**List of Communication Strategies with pictorial representation: Overcome the Communication Barriers**

| <b>A. Barriers related to communication breakdowns and strategies</b>                                                                                      |                                                                                                      |                                                                                                                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>I. Stroke patients often find it difficult to seek help or to tell about their pain and discomfort to HCPs, due to their communication impairments.</b> |                                                                                                      |                                                                                                                                                                              |
| 1.                                                                                                                                                         | Encourage caregivers to take the lead in interactions (e.g., describing pain or preferences).        | <p><b>CARE GIVER AND DOCTOR HELPING STROKE PATIENT TO EXPRESS THERE PAIN OR NEEDS</b></p>  |
| 2.                                                                                                                                                         | Give extended time for patient responses in order to allow adequate comprehension and expression.    |                                                                                           |
| 3.                                                                                                                                                         | Attend to non-verbal cues such as body language, facial expressions, and tone.                       |                                                                                          |
| 4.                                                                                                                                                         | Demonstrate persistence and patience when engaging with patients to reduce communication breakdowns. |                                                                                                                                                                              |

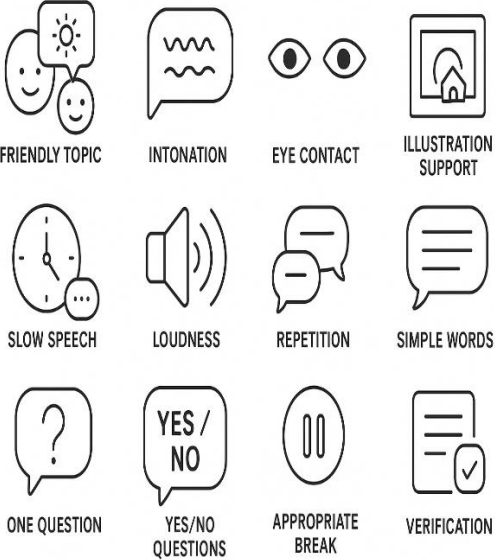
|    |                         |                                                                                                                                                                                                                                                                                                                                       |
|----|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                         |                                                                                                                                                                                                                                                     |
| 5. | Building rapport        |                                                                                                                                                                                                                                                     |
| 6. | Use total communication | <p><b>Total Communication for Stroke Patients</b></p>  <div> <div>Speech</div> <div>Gestures</div> <div>Facial Expressions</div> <div>Writing</div> <div>Drawing</div> <div>Pictures/Symbols</div> <div>Yes/No</div> <div>Technology</div> </div> |

|                                                                                                                                                    |                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7.                                                                                                                                                 | <p>Encourage use of preserved communication modalities, such as:</p> <ul style="list-style-type: none"> <li>○ Eye movements</li> <li>○ Gestures</li> <li>○ Head nods</li> </ul>                   |  <p>The illustration shows a speech-language pathologist (SLP) sitting at a table with a patient. The SLP is pointing to a card with a drawing of a house. The patient is looking at the card and nodding. Labels include 'eye movements', 'yes', 'gesture', and 'SPEECH= LANGUAGE PATHOLOGIST'. A circular banner at the bottom reads 'Using preserved communication modalities'.</p> |
| 8.                                                                                                                                                 | <p>Incorporate visual supports such as:</p> <ul style="list-style-type: none"> <li>a. Pointing to body parts or objects</li> <li>b. Using simple drawings employing facial expressions</li> </ul> |  <p>The illustration shows a healthcare provider (HCP) with a stethoscope around her neck, asking a patient in a hospital bed to point where it hurts. The patient is pointing to his chest. A speech bubble from the HCP says 'ASK STROKE PATIENT TO POINT WHERE IT HURTS'. There is an IV drip and a heart rate monitor in the background.</p>                                      |
| 9.                                                                                                                                                 | <p>Use of simple Yes/No questions</p>                                                                                                                                                             |  <p>The illustration shows a healthcare provider (HCP) sitting and talking to a patient in a wheelchair. The HCP asks, 'Do you feel pain?' and the patient responds, 'Yes'.</p>                                                                                                                                                                                                      |
| <p><b>II. Stroke patients often rely on family members to communicate their symptoms instead of speaking directly to healthcare providers.</b></p> |                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

|           |                                                                                                                                                                                                                                                                                      |                                                                                     |
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| <p>1.</p> | <p>Involve family members in communication, as they can:</p> <ul style="list-style-type: none"> <li>a. Recognize subtle cues and expressions</li> <li>b. Support consistent communication across settings, engaging the patient through focused attention and questioning</li> </ul> |   |
| <p>2.</p> | <p>Counsel family members about active and passive participation during therapy and during conversation at home.</p>                                                                                                                                                                 |  |
| <p>3.</p> | <p>Train families in supportive communication, including:</p> <ul style="list-style-type: none"> <li>a. Speaking slowly</li> <li>b. Repeating keywords</li> <li>c. Validating the patient's communication attempts</li> </ul>                                                        |                                                                                     |

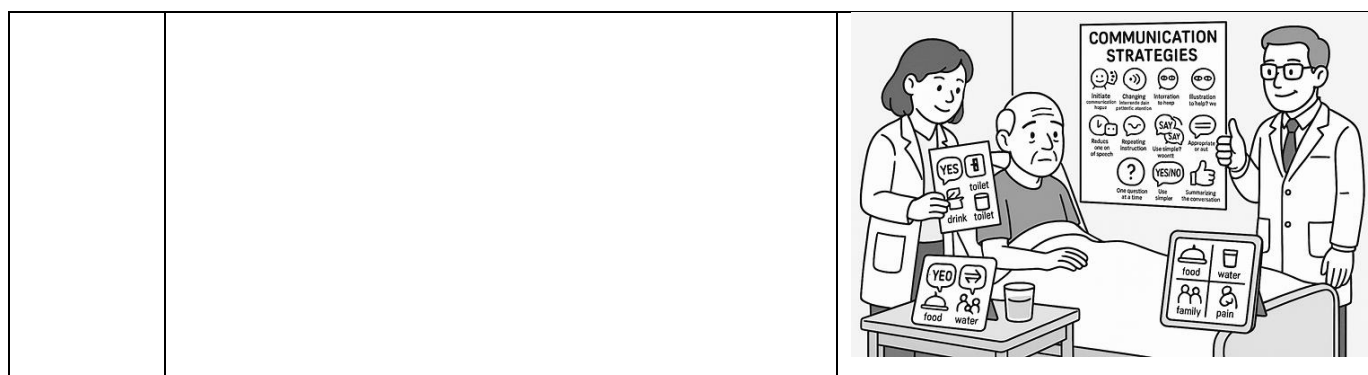
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| 4. | Provide appropriate breaks, time for response between questions.                             |   |
| 5. | Use a slow speaking rate with appropriate audibility, clear articulation, and pronunciation. |  |
| 6. | Avoid speaking on behalf of the patient; allow space and time for their own responses.       |                                                                                      |

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|    |                                                                                                         |  <p>ALLOW SPACE</p>       |
| 7. | Encourage all patient communication efforts, even if incomplete.                                        |  <p>ENCOURAGE EFFORT</p> |
| 8. | Instead of filling their words, time can be given to make them complete what they are intending to say. |  <p>GIVE TIME</p>       |

|            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                         |
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| <p>9.</p>  | <p><i>The following are the Communication strategies all healthcare professionals &amp; caregivers can use while communicating with stroke patients:</i></p> <ul style="list-style-type: none"> <li>○ Initiate communication with a friendly topic</li> <li>○ Changing Intonations to gain patients' attention</li> <li>○ Maintain eye contact</li> <li>○ Illustration to help stroke patients understand and express the message</li> <li>○ Reduce the rate of speech</li> <li>○ Increase loudness</li> <li>○ Repeating instruction</li> <li>○ Use of simpler words, short sentences, and phrases</li> <li>○ One question at a time</li> <li>○ Use of yes/no questions</li> <li>○ Appropriate break</li> <li>○ Feedback</li> <li>○ Summarizing the conversation</li> </ul> |  <p>FRIENDLY TOPIC    INTONATION    EYE CONTACT    ILLUSTRATION SUPPORT</p> <p>SLOW SPEECH    LOUDNESS    REPETITION    SIMPLE WORDS</p> <p>ONE QUESTION    YES/NO QUESTIONS    APPROPRIATE BREAK    VERIFICATION</p> |
| <p>10.</p> | <p>Be respectful to the patient (i.e., wishing good morning, etc.)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  <p>GOOD MORNING!</p> <p>BE RESPECTFUL TO PATIENTS</p>                                                                                                                                                              |

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| 11. | Communicate positively, using an acknowledging tone.                                                                             |  <p>Good.<br/>Yes, I understand.</p> <p>COMMUNICATE POSITIVELY,<br/>USING ACKNOWLEDGING TONE</p>                 |
| 12. | Simplify the task to increase the motivation.                                                                                    |  <p>WELL DONE!</p> <p>SIMPLIFY THE TASK/<br/>ACTIVITY AND INCREASE<br/>THE MOTIVATION</p>                       |
| 13. | Demonstrate persistence and patience when engaging with patients to reduce communication breakdowns.                             |  <p>Take your time.<br/>I'm listening.</p> <p>PATIENCE<br/>Try again</p> <p>PERSISTENCE<br/>&amp; PATIENCE</p> |
| 14. | Use simplified language to enhance understanding. Reinforce instructions and therapeutic goals during hospital stay and at home. |                                                                                                                                                                                                    |

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| 15. | Use total communication with stroke patients for having a conversation. If no response or a limited response, use a choice-based conversation/ Polar question. |   |
| 16. | Train the persons to point towards objects.                                                                                                                    |  |
| 17. | Provide a bedside toolkit (e.g., written instructions on effective communication strategies for the patient).                                                  |                                                                                      |



### III. Stroke patients are less likely to ask questions about their diagnosis due to communication difficulties

1. Make the information more accessible for the patients.  
E.g.: Use of Accessible information- Explaining the content with the use of simple, short sentences with appropriate icons.

2. Try to explain the conditions using flowcharts and pictures/ visual aids.

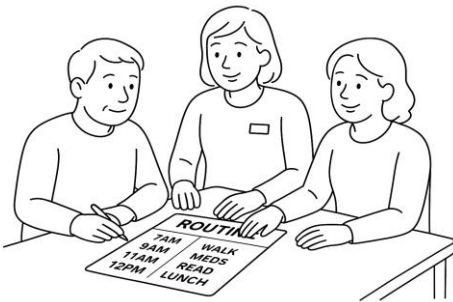
3. It's the treating professional's duty to explain the condition name, cause, and how the treatment happens- videos or images related to stroke and possible conditions like aphasia/dysphagia/ dysarthria can be explained.

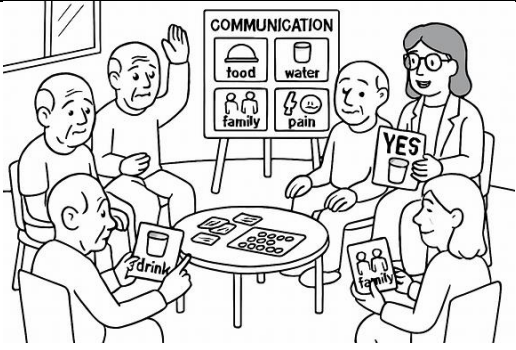
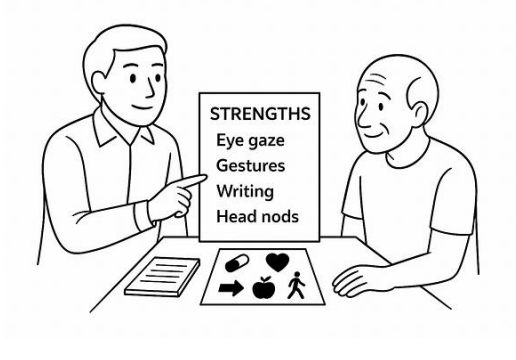
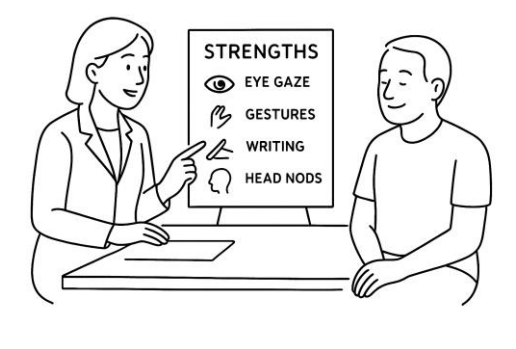
4. Encourage the patients to communicate/Support communication and active participation- Use total communication.

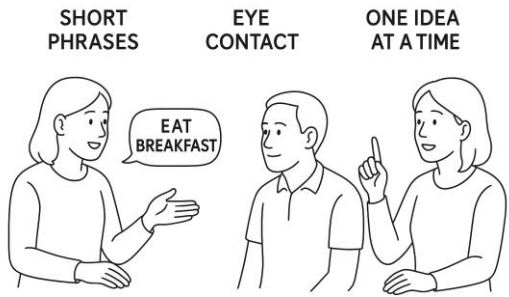
5. Instructing and informing about the procedure

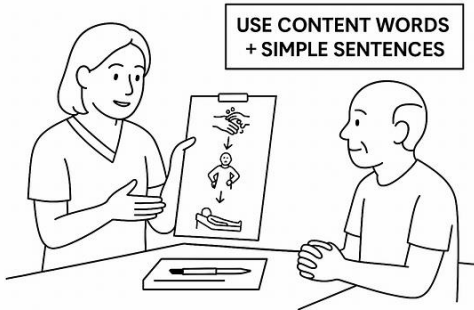
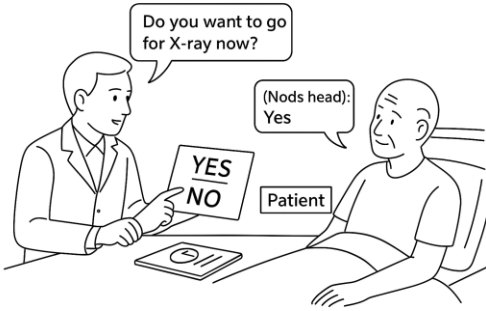
6. Continues to provide information about every procedure a professional carries out



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| 7.                                                                                                                                          | Clearly explain the nature of the patient's communication deficits to caregivers.                                                                            |                                                                                      |
| <b>IV. Stroke patients are less likely to comprehend the lifestyle changes or treatment, which acts as a communication barrier for HCPs</b> |                                                                                                                                                              |                                                                                      |
| 1.                                                                                                                                          | Having a routine to remind them to do lifestyle things                                                                                                       |    |
| 2.                                                                                                                                          | Motivate the patient to attend speech and language therapy.                                                                                                  |   |
| 3.                                                                                                                                          | Healthcare providers can work with speech-language pathologists (SLPs) to create simple materials about medications, treatment plans, and lifestyle changes. |  |

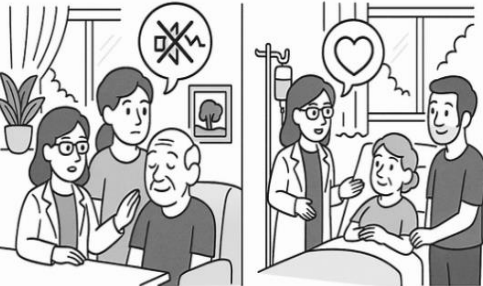
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| 4. | Introduce Group therapy                                                                                       |    |
| 5. | Introduce strategies pertinent to their preserved strength.                                                   |    |
| 6. | Create Awareness among caregivers of what abilities the patient has retained (e.g., comprehension, gestures). |   |
| 7. | Use caregiver insight into the patient's communication habits, gestures, and mood to enhance understanding.   |  |
| 8. | Facilitate conversations using the patient's familiar cues or gestures.                                       |                                                                                      |

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| 9.                                                                                                                             | <p>Instruct caregivers to support communication using:</p> <ul style="list-style-type: none"> <li>○ Short phrases</li> <li>○ Eye contact</li> <li>○ One idea at a time</li> </ul> |   |
| <b>V. Stroke patients require frequent reminders or repetitions of information regarding hospital procedures to aid recall</b> |                                                                                                                                                                                   |                                                                                     |
| 1.                                                                                                                             | <p>Use a functional communication approach (e.g., involve them in a conversation about their daily routines or things to be done for today or in the next few days)</p>           |  |
| 2.                                                                                                                             | <p>A caretaker to remind and support</p>                                                                                                                                          |                                                                                     |

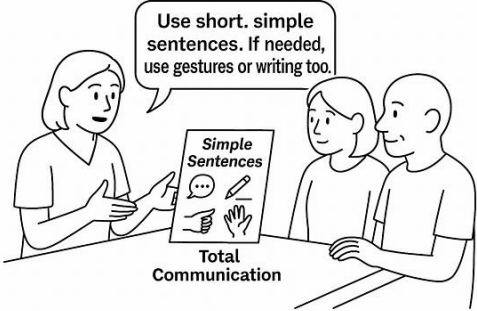
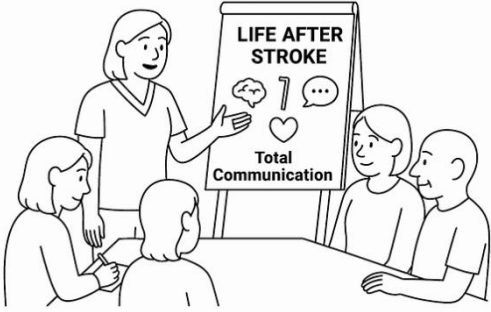
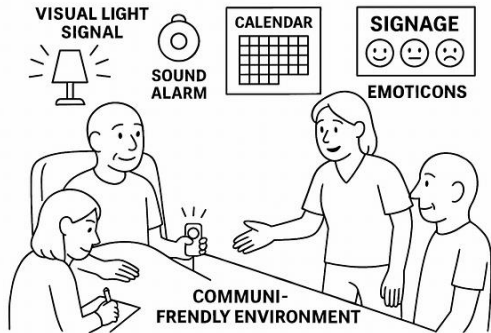
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| <b>VI. Stroke patients often struggle to understand descriptions of what is happening or will happen during hospital procedures</b>         |                                                                                          |                                                                                      |
| 1.                                                                                                                                          | Use a content word approach to explain the procedure step by step.                       |   |
| 2.                                                                                                                                          | Use simple sentences and explain (Using short sentences; layman's terms)                 |                                                                                      |
| <b>VII. Communication impairments in stroke patients make it difficult for them to express the events leading to their hospitalization.</b> |                                                                                          |                                                                                      |
| 1.                                                                                                                                          | Use an alternate mode of communication (e.g., writing, gestures)                         |  |
| 2.                                                                                                                                          | Asking yes or no questions simply to make them nod their head for the appropriate events |                                                                                      |

## B. Environmental Barriers and Strategies

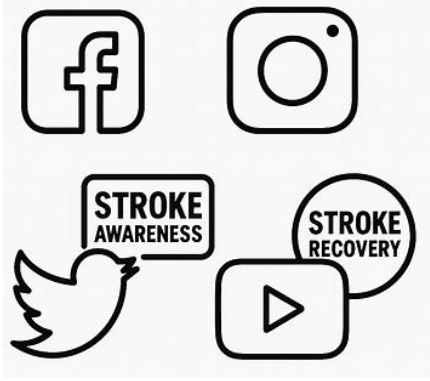
### I. Lack of awareness of strategies to modify the environmental barriers leads to communication difficulties with stroke patients.

|    |                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| 1. | <p>Maintain a calm environment and supportive atmosphere at home and in the hospital to aid both communication and emotional well-being.</p>                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                 |
| 2. | <p>Reduce auditory distractions, such as:</p> <ul style="list-style-type: none"> <li>○ Lowering television volume</li> <li>○ Minimizing background noise by avoiding distractions like TV &amp; radio music at home</li> <li>○ Minimizing background noise by avoiding multiple caregivers speaking at the hospital</li> <li>○ Speak in low-stimulation zones, such as the corner of the room</li> </ul> | <p style="text-align: center;"><b>Avoiding Multiple Caregivers</b></p>  <p style="text-align: center;"><b>Avoiding Noise</b></p>  <p style="text-align: center;">By minimizing background noise and TV volume, and creating a pleasant environment for stroke patients</p> |
| 3. | <p>Sitting positions:</p> <ul style="list-style-type: none"> <li>○ Maintain eye-level positioning when communicating with the patient.</li> </ul>                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

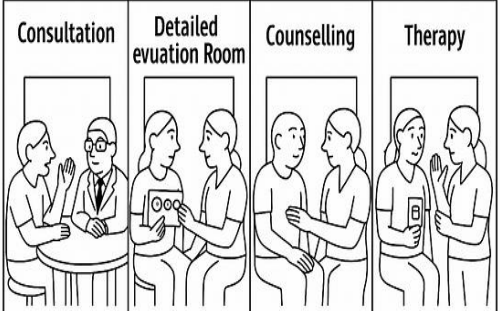
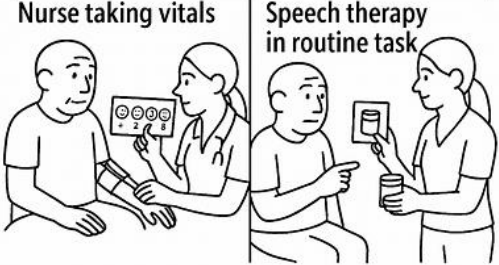
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|    | <ul style="list-style-type: none"> <li>Stand and communicate on stronger side of the body.</li> </ul>                                     | <p><b>Sitting Positions</b></p> <p>• Maintain eye-level positioning when communicating with patient.</p> <p>• Stand and communicate on stronger side of the body</p> |
| 4. | Training on environmental modifications such as quiet surroundings, face to face interactions to support visual and emotional connection. | <p>QUIET SURROUNDINGS</p> <p>FACE-TO-FACE INTERACTION</p> <p>ENVIRONMENTAL MODIFICATIONS</p> <p>EMOTIONAL CONNECTION</p>                                             |
| 5. | Record patient communication preferences                                                                                                  | <p>RECORDING COMMUNICATION PREFERENCES</p>                                                                                                                           |
| 6. | Mobility – Use of a wheelchair or walker to reach the communication partner                                                               | <p>REACH THE COMMUNICATION PARTNER</p>                                                                                                                               |

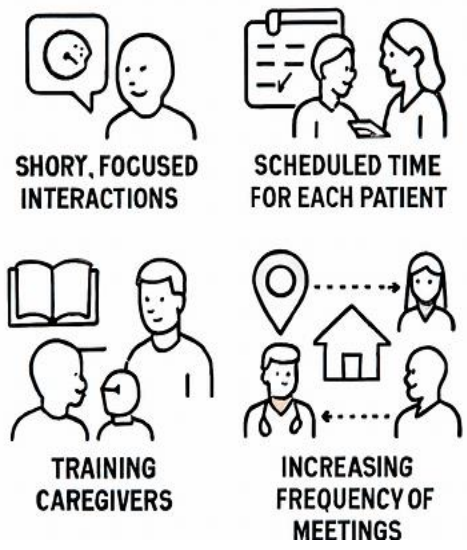
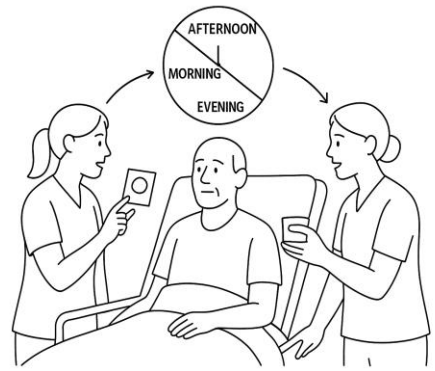
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| 7.  | Counsel caregivers to talk to them in simple sentences or use total communication if required.                                                              |    |
| 8.  | Create an awareness program for family members and friends to understand the consequences of stroke and manage them in their regular day-to-day activities. |    |
| 9.  | Communication friendly environment with lights or sound alarms to call                                                                                      |   |
| 10. | Provide clearly labelled visual aids, such as a calendar, signage, and emoticons.                                                                           |  |

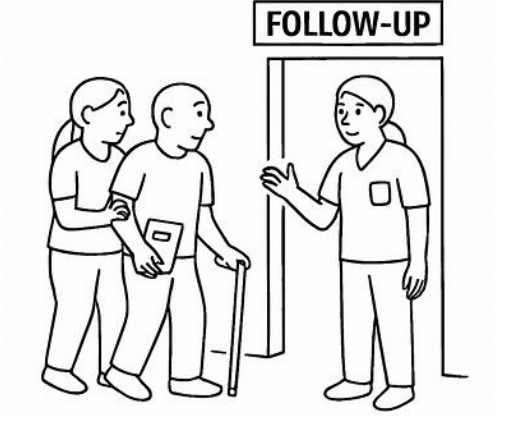
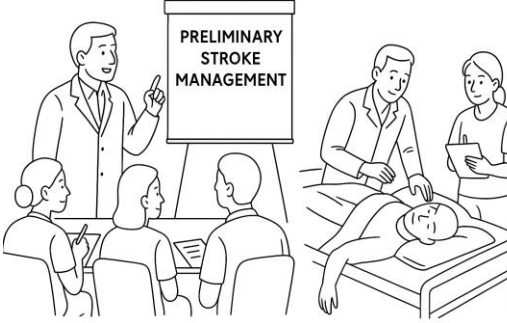
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| 11.                                                                                                                                                         | Involve allied health professionals (e.g., occupational therapists, audiologists) to adapt the environment as needed. |    |
| <b>II. It is challenging for HCPs to get follow-ups and to communicate with rural people due to a lack of education or awareness about stroke recovery.</b> |                                                                                                                       |                                                                                      |
| 1.                                                                                                                                                          | Collaboration with local hospitals/Primary health care.                                                               |   |
| 2.                                                                                                                                                          | Create awareness about stroke recovery and encourage tele-rehabilitation/ assessment.                                 |  |
| 3.                                                                                                                                                          | Awareness programs/ Camps                                                                                             |                                                                                      |

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|                                                                                                                                                                           |                                                                        |    |
| 4.                                                                                                                                                                        | Awareness videos, advertisements on social platforms, and posters      |    |
| 5.                                                                                                                                                                        | Development of Pamphlets                                               |  |
| <b>III. The presence of multiple caregivers (family members, home nurses, etc.) with different levels of understanding leads to mixed communication with the patient.</b> |                                                                        |                                                                                      |
| 1.                                                                                                                                                                        | Provide information in easy language for the caregivers for reference. |                                                                                      |

|                                                                                                                                            |                                                                                                                                                |                                                                                     |
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| 2.                                                                                                                                         | Use a shared communication log or bedside care diary to document effective strategies.                                                         |  |
| 3.                                                                                                                                         | Create an Awareness program for family members and friends to understand the consequences of stroke and manage them in their daily activities. |                                                                                     |
| 4.                                                                                                                                         | SLPs can counsel the nurses about how to effectively communicate with patients while carrying out certain tasks.                               |                                                                                     |
| 5.                                                                                                                                         | Nurses can join one of the Speech Language Therapy sessions to understand the communication strategies.                                        |                                                                                     |
| 6.                                                                                                                                         | Group interaction with all family members once a week or a month, even online, to make them understand                                         |                                                                                     |
| 7.                                                                                                                                         | Make sure to give home training counselling sheets so they can share with individuals at home.                                                 |                                                                                     |
|                                                                                                                                            |                                                                                                                                                |                                                                                     |
| <b>C. Time and Work-Related barriers and strategies</b>                                                                                    |                                                                                                                                                |                                                                                     |
| <b>I. Limited time for patient interaction with the health care professionals leads to communication breakdown with the professionals.</b> |                                                                                                                                                |                                                                                     |

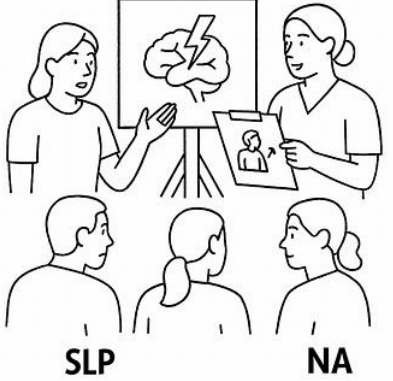
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| 1. | Support from a Multidisciplinary team can help (rather than 1 patient attending 3-4 professionals, make all the services available under one roof, and save time)           |    |
| 2. | Can use the approach of dividing the section of assessment among the professionals (e.g., initial case history followed by a specific test battery assessment)              |   |
| 3. | Integrate communication into routine care tasks, such as: <ul style="list-style-type: none"> <li>○ During hygiene care</li> <li>○ While administering medication</li> </ul> |  |
| 4. | Turn passive routines into interactive communication opportunities.                                                                                                         |  |

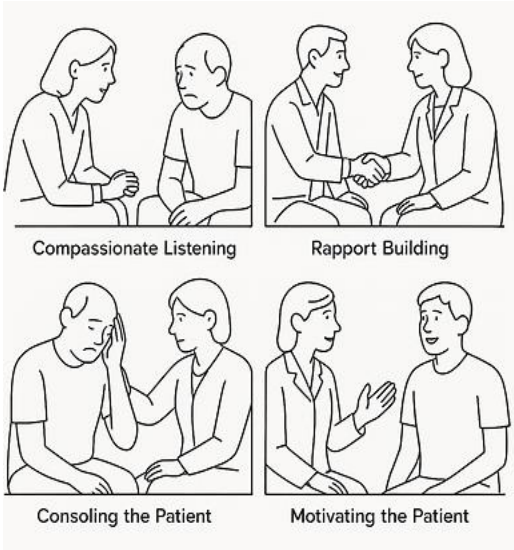
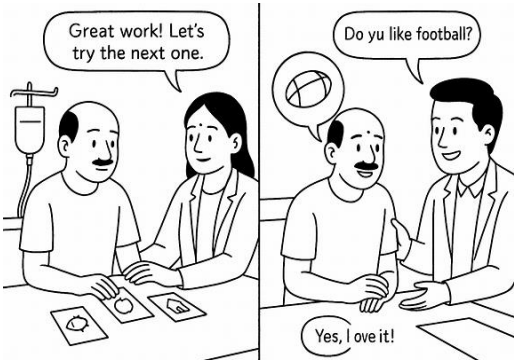
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| 5. | <p>Pre-schedule:</p> <ul style="list-style-type: none"> <li>○ Short, focused interactions throughout the day instead of relying on one long conversation.</li> <li>○ Scheduled time for each patient</li> <li>○ Can also train caregivers for the possible task</li> <li>○ Can try to connect with professionals who are near the patient's home, so the frequency of meetings will be increased</li> </ul> |  <p><b>SHORT, FOCUSED INTERACTIONS</b></p> <p><b>SCHEDULED TIME FOR EACH PATIENT</b></p> <p><b>TRAINING CAREGIVERS</b></p> <p><b>INCREASING FREQUENCY OF MEETINGS</b></p> |
| 6. | Create structured time slots for patient updates, even brief five-minute check-ins.                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                             |
| 7. | Ensure interdisciplinary coordination to avoid duplication and communication gaps.                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                          |
| 8. | Recruiting more SLPs to encourage shift-based work                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                         |

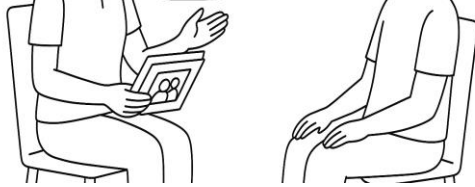
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| 9.                                                                                                               | Can introduce tele-rehabilitation options                           | <p><b>ENCOURAGE RURAL PATIENT FOR TELE-REHABILITATION</b></p>  |
| 10.                                                                                                              | Call for regular, frequent follow-ups.                              | <p><b>FOLLOW-UP</b></p>                                       |
| 11.                                                                                                              | Train allied health professionals in preliminary stroke management. | <p><b>PRELIMINARY STROKE MANAGEMENT</b></p>                  |
| <p><b>II. Conversations with stroke patients are often rushed due to the high patient load in hospitals.</b></p> |                                                                     |                                                                                                                                                  |

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| 1. | <p>Divide communication responsibilities:</p> <ul style="list-style-type: none"> <li>a. Nurses handle daily care-related communication.</li> <li>b. Physicians focus on medical updates and decision-making.</li> <li>c. Nurses can join one of the SLT sessions to understand the communication strategies</li> </ul> |                                                                                                         |
| 2. | <p>Encourage clinicians to slow down briefly during interactions, recognizing that doing so:</p> <ul style="list-style-type: none"> <li>a. Improves clarity</li> <li>b. Reduces confusion and errors. Minimizes the need for repeated explanations</li> </ul>                                                          | <p><b>Encourage clinicians to slow down briefly during interactions, recognizing that doing so:</b></p> |
| 3. | <p>Equip local health workers with communication toolkits to sustain culturally sensitive stroke care.</p>                                                                                                                                                                                                             |                                                                                                         |

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|                                                                                                                                                                 |                                                                                                                                                                       |                                                                                                                    |
| <b>III. Work-related pressures, such as tight schedules and staffing shortages, create a challenging situation for HCPs to communicate with stroke patients</b> |                                                                                                                                                                       |                                                                                                                                                                                                      |
| 1.                                                                                                                                                              | Empower support staff (e.g., nursing assistants) to: <ul style="list-style-type: none"> <li>○ Confirm patient understanding</li> <li>○ Explain basic tasks</li> </ul> | <ul style="list-style-type: none"> <li>• Confirm patient understanding</li> <li>• Explain basic tasks</li> </ul>  |
| 2.                                                                                                                                                              | Can introduce tele-rehabilitation options                                                                                                                             |                                                                                                                  |
| 3.                                                                                                                                                              | Recruiting more SLPs or encouraging shift-based work                                                                                                                  |                                                                                                                                                                                                      |

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|                                                                                                                                       |                                                                         |    |
| 4.                                                                                                                                    | Call for regular, frequent follow-ups.                                  |   |
| 5.                                                                                                                                    | Train allied health professionals in the preliminary stroke management. |  |
|                                                                                                                                       |                                                                         |                                                                                      |
| <b>D. Emotional and Psychological Barriers</b>                                                                                        |                                                                         |                                                                                      |
| <b>I. Professionals frequently encounter stubborn or resistant behaviour from stroke patients during rehabilitation or treatment.</b> |                                                                         |                                                                                      |

|     |                                                                                                                                          |                                                                                                                                                                                                  |
|-----|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.  | Recognize emotional distress (e.g., depression, anger, denial, withdrawal) as communication barriers, not resistance or non-cooperation. |  <p>Compassionate Listening      Rapport Building</p> <p>Consoling the Patient      Motivating the Patient</p> |
| 2.  | Practice compassionate listening, allowing patients to feel heard and understood.                                                        |                                                                                                                                                                                                  |
| 3.  | Rapport building, take time to interact- Validate the patient's emotional experiences as a natural response to loss and vulnerability    |                                                                                                                                                                                                  |
| 4.  | Giving sufficient time to respond                                                                                                        |                                                                                                                                                                                                  |
| 5.  | Consoling patients and engaging in conversation about existential or difficult issues                                                    |                                                                                                                                                                                                  |
| 6.  | Support communication and active participation                                                                                           |                                                                                                                                                                                                  |
| 7.  | Motivate the patient by setting easy goals initially and using positive reinforcement.                                                   |                                                                                                                                                                                                  |
| 8.  | Accompany the caretaker with the patient in a session.                                                                                   |                                                                                                               |
| 9.  | Use client client-centered approach.                                                                                                     |  <p>Great work! Let's try the next one.</p> <p>Do you like football?</p> <p>Yes, I love it!</p>              |
| 10. | Try to plan the session more interactively, by incorporating patients' interesting topics in between the activities or as reinforcement. |                                                                                                                                                                                                  |

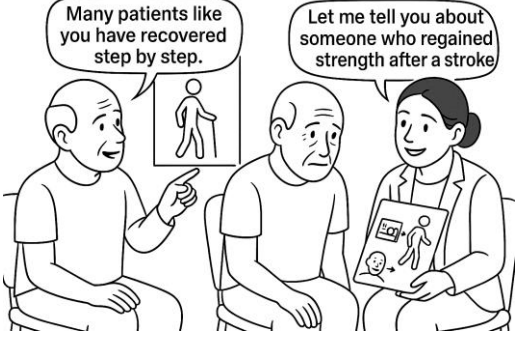
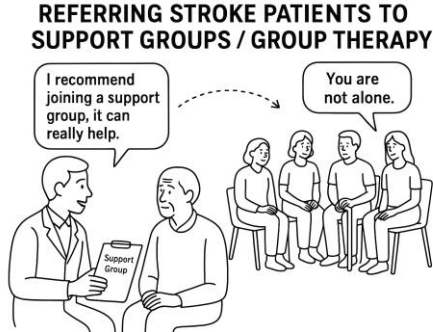
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| 11.                                                                                                                                                        | Can refer to psychological counselling/support services, if emotional challenges persist                                                                                                                                                                                                    |    |
| 12.                                                                                                                                                        | Engage in routine, friendly, non-clinical conversations, such as: <ul style="list-style-type: none"> <li>○ Offering greetings</li> <li>○ Asking about the patient's interests</li> <li>○ Entertain using old photos, previous interest, and encourage them to express themselves</li> </ul> |   |
| 13.                                                                                                                                                        | Build rapport and trust through consistent, supportive interactions.                                                                                                                                                                                                                        |   |
| 14.                                                                                                                                                        | Utilize group-based therapy where appropriate to foster peer support and shared communication experiences.                                                                                                                                                                                  |  |
| <b>II. Emotional stress, frustration, and anxiety in stroke patients negatively impact their willingness to communicate with healthcare professionals.</b> |                                                                                                                                                                                                                                                                                             |                                                                                      |

|    |                                                                                       |  |
|----|---------------------------------------------------------------------------------------|--|
| 1. | Consoling patients and engaging in conversation about existential or difficult issues |  |
| 2. | Communicate positively, using an acknowledging/reassuring tone.                       |  |
| 3. | Simplify the task to increase the motivation.                                         |  |
| 4. | Take help from a Psychologist/ Psychological counselling.                             |  |
| 5. | Be gentle to the patients.                                                            |  |
| 6. | Practice compassionate listening, allowing patients to feel heard and understood.     |  |
| 7. | Provide visual aids and non-verbal cues.                                              |  |

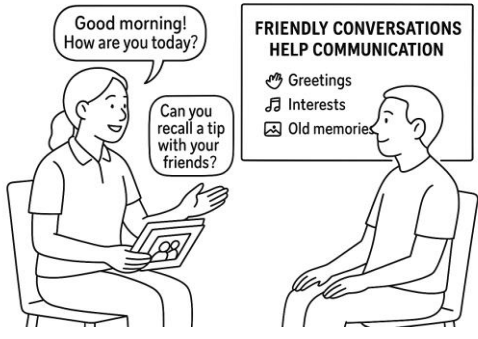
### III. Depression and social stigma associated with stroke lead to reduced patient participation in medical discussions with healthcare professionals

|    |                                                                           |                                                  |
|----|---------------------------------------------------------------------------|--------------------------------------------------|
| 1. | Knowledge on sympathy vs empathy                                          | <p><b>SYMPATHY vs EMPATHY IN STROKE CARE</b></p> |
| 2. | Use a calm and reassuring tone of voice to create a safe emotional space. |                                                  |

|    |                                                                                       |                                                                                      |
|----|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|    |                                                                                       |    |
| 3. | Consoling patients and engaging in conversation about existential or difficult issues |   |
| 4. | Offer gentle encouragement to patients with apathy or low motivation.                 |  |
| 5. | Celebrate small communication successes to reinforce progress.                        |  |

|    |                                                                               |                                                                                                                                                                                                                                                                        |
|----|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6. | Maintain Calm and neutral facial reaction while interacting with the patient. |  <p>OFFER GENTLE ENCOURAGEMENT</p> <p>CELEBRATE SMALL SUCCESSSES</p> <p>MAINTAIN CALM REACTION</p> <p>SUPPORT, NOT STIGMA</p> <p>CREATE AWARENESS</p>                                |
| 7. | Create Awareness to reduce stigma.                                            |  <p>STROKE</p> <p>INCLUSION</p> <p>CREATE AWARENESS TO REDUCE STIGMA AMONG PATIENTS &amp; CAREGIVERS</p>                                                                            |
| 8. | Motivate the patients with success stories of other stroke patients.          |  <p>Many patients like you have recovered step by step.</p> <p>Let me tell you about someone who regained strength after a stroke</p>                                              |
| 9. | Refer to Support groups/Group therapy.                                        |  <p>REFERRING STROKE PATIENTS TO SUPPORT GROUPS / GROUP THERAPY</p> <p>I recommend joining a support group, it can really help.</p> <p>You are not alone.</p> <p>Support Group</p> |

|                                                                                                                                                                     |                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IV. Leaving patients lonely in a ward hampered the communication abilities of the stroke individuals.                                                               |                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 1.                                                                                                                                                                  | Encourage interaction with staff.                                                                  | <div><p><b>SUPPORTIVE STRATEGIES IN STROKE REHABILITATION</b></p><p><b>Encourage Interaction with Staffs</b><br/>Hello!</p><p><b>Shift-Based Caregiver</b><br/>Caregivers change by shift for continuous support</p><p><b>Starting SLT at the Wards</b><br/>Promote friendly staff-patient communication</p><p><b>Stroke Rehabilitation Support</b></p><p><b>Group Activities</b><br/>Organize communal activities</p></div> |
| 2.                                                                                                                                                                  | Shift-based caregiver                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 3.                                                                                                                                                                  | Starting SLT at the wards                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 4.                                                                                                                                                                  | Group activities                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                              |
| V. HCPs often find it difficult to communicate with stroke patients when they exhibit a lack of motivation during their rehabilitation process in a hospital setup. |                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 1.                                                                                                                                                                  | Acknowledge and reinforce patient communication attempts, even small efforts, to build confidence. | <div><p><b>ACKNOWLEDGE AND REINFORCE SMALL EFFORTS</b></p><p>Good job!</p></div>                                                                                                                                                                                                                                                                                                                                             |
| 2.                                                                                                                                                                  | Set small, achievable communication goals to promote self-motivation and engagement.               |                                                                                                                                                                                                                                                                                                                                                                                                                              |

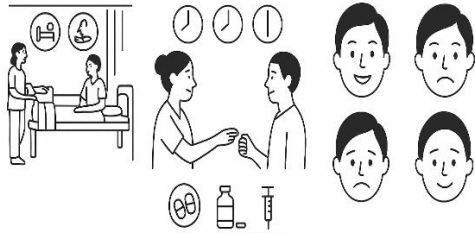
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|                                                                                  |                                                                                                                                                                                                                                                                                                    |   |
| 3.                                                                               | <p>Engage in routine, friendly, non-clinical conversations, such as:</p> <ul style="list-style-type: none"> <li>○ Offering greetings</li> <li>○ Asking about the patient's interests</li> <li>○ Entertain using old photos, previous interest, and encourage them to express themselves</li> </ul> |  |
| <b>E. Comorbidity-related barrier</b>                                            |                                                                                                                                                                                                                                                                                                    |                                                                                     |
| <b>I. Hearing loss in elderly stroke patients makes communication difficult.</b> |                                                                                                                                                                                                                                                                                                    |                                                                                     |
| 1.                                                                               | Recommend Audiological rehabilitation                                                                                                                                                                                                                                                              |                                                                                     |
| 2.                                                                               | If required, suggest the use of a hearing aid.                                                                                                                                                                                                                                                     |                                                                                     |
| 3.                                                                               | Use visual cues while speaking to patients.                                                                                                                                                                                                                                                        |                                                                                     |
| 4.                                                                               | Maintain a quiet environment and avoid background noise.                                                                                                                                                                                                                                           |                                                                                     |
| 5.                                                                               | Increase loudness, speak loudly.                                                                                                                                                                                                                                                                   |                                                                                     |
| 6.                                                                               | Speak slowly and clearly.                                                                                                                                                                                                                                                                          |                                                                                     |

|                                                                                                                                                                                                                                          |                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                             |                                                                                                                                                                         |                                                                                                                                                     |                                                                                                                                                                      |                                                                                                                                                                                                                                          |                                                                                                                                                               |
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| 7.                                                                                                                                                                                                                                       | Use nonverbal cues                                                                                                                                                      | <div><div><h3>COMMUNICATION STRATEGIES<br/>FOR PATIENTS WITH<br/>HEARING DIFFICULTIES</h3><table><tr><td><b>RECOMMEND<br/>AUDIOLOGICAL REHAB</b><br/><br/>Let's assess your hearing and speech needs</td><td><b>SUGGEST HEARING AID IF NEEDED</b><br/><br/>A hearing aid might help you hear better</td></tr><tr><td><b>USE VISUAL CUES</b><br/><br/>Use gestures at facial expressions</td><td><b>MAINTAIN QUIET ENVIRONMENT</b><br/><br/>Reduce background noise for better focus</td></tr><tr><td><b>SPEAK LOUDLY</b> <br/><br/>Raise your voice and pronounce clearly</td><td><b>SPEAK SLOWLY &amp; CLEARLY</b><br/><br/>Body language helps understanding</td></tr></table></div></div> | <b>RECOMMEND<br/>AUDIOLOGICAL REHAB</b><br><br>Let's assess your hearing and speech needs | <b>SUGGEST HEARING AID IF NEEDED</b><br><br>A hearing aid might help you hear better | <b>USE VISUAL CUES</b><br><br>Use gestures at facial expressions | <b>MAINTAIN QUIET ENVIRONMENT</b><br><br>Reduce background noise for better focus | <b>SPEAK LOUDLY</b> <br><br>Raise your voice and pronounce clearly | <b>SPEAK SLOWLY &amp; CLEARLY</b><br><br>Body language helps understanding |
| <b>RECOMMEND<br/>AUDIOLOGICAL REHAB</b><br><br>Let's assess your hearing and speech needs                                                              | <b>SUGGEST HEARING AID IF NEEDED</b><br><br>A hearing aid might help you hear better |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                             |                                                                                                                                                                         |                                                                                                                                                     |                                                                                                                                                                      |                                                                                                                                                                                                                                          |                                                                                                                                                               |
| <b>USE VISUAL CUES</b><br><br>Use gestures at facial expressions                                                                                      | <b>MAINTAIN QUIET ENVIRONMENT</b><br><br>Reduce background noise for better focus    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                             |                                                                                                                                                                         |                                                                                                                                                     |                                                                                                                                                                      |                                                                                                                                                                                                                                          |                                                                                                                                                               |
| <b>SPEAK LOUDLY</b> <br><br>Raise your voice and pronounce clearly | <b>SPEAK SLOWLY &amp; CLEARLY</b><br><br>Body language helps understanding           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                             |                                                                                                                                                                         |                                                                                                                                                     |                                                                                                                                                                      |                                                                                                                                                                                                                                          |                                                                                                                                                               |

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F. Awareness and knowledge related to communication barriers and strategies

I. The lack of patient-friendly communication tools, such as multilingual pamphlets, regional language videos, and culturally adapted visual aids, hinders effective communication between professionals and stroke patients.

|    |                                                                                                                                                                                                      |                                                                                                                                                                                              |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | Provide educational pamphlets or pictorial tools in regional languages covering: <div>             a. Ward instructions             b. Medication routines             c. Emotional responses </div> |  <div> <div>Ward Instructions</div> <div>Medication Routines</div> <div>Emotional Responses</div> </div> |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

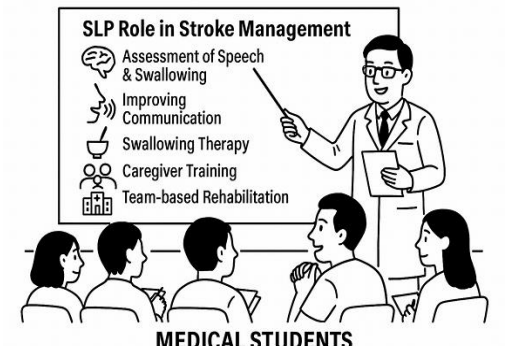
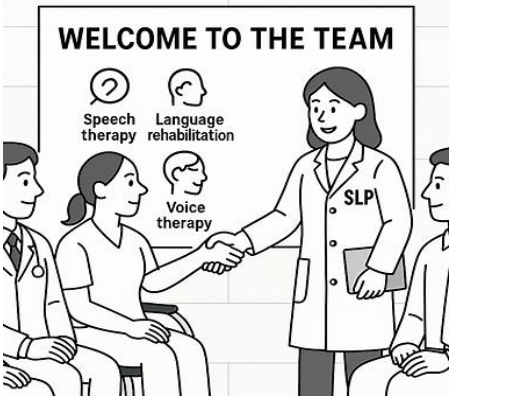
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| 2.                                                                                                                                                 | Pamphlet to educate -professions, patients, and for care taker-Need to develop                                                                                                            |                                                                                                                                                         |
| 3.                                                                                                                                                 | Develop patient-friendly communication tools, such as multilingual pamphlets, regional language videos, and culturally adapted visual aids, with the help of an SLP.                      | <p><b>Communication aid development with help from an SLP</b></p>  <p><b>Awareness programs on communication difficulties with stroke patients</b></p> |
| 4.                                                                                                                                                 | Culture-based specific material needs to be developed, using culturally appropriate visual aids, incorporating:<br>a. Familiar imagery<br>b. Context relevant to the patient's background |                                                                                                                                                                                                                                           |
| 5.                                                                                                                                                 | Try to translate the materials in case the material is unavailable.                                                                                                                       |                                                                                                                                                                                                                                           |
| 6.                                                                                                                                                 | Try to use a translator in case if professionals are unaware of the language.                                                                                                             |                                                                                                                                                                                                                                           |
| 7.                                                                                                                                                 | Creation of videos by student Professionals                                                                                                                                               |                                                                                                                                                                                                                                           |
| 8.                                                                                                                                                 | Equip local health workers with communication toolkits to sustain culturally sensitive stroke care.                                                                                       |                                                                                                                                                                                                                                           |
| <b>II. There is a lack of structured communication training for medical healthcare professionals to interact effectively with stroke patients.</b> |                                                                                                                                                                                           |                                                                                                                                                                                                                                           |
| 1.                                                                                                                                                 | Organize periodic training programs on communication strategies for stroke care.                                                                                                          |                                                                                                                                                                                                                                           |
| 2.                                                                                                                                                 | Create awareness programs for medical healthcare professionals.                                                                                                                           |                                                                                                                                                                                                                                           |

|    |                                                                             |                                                                                    |
|----|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| 3. | Can train simple total communication strategies to HCPs and other educators |  |
|----|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------|

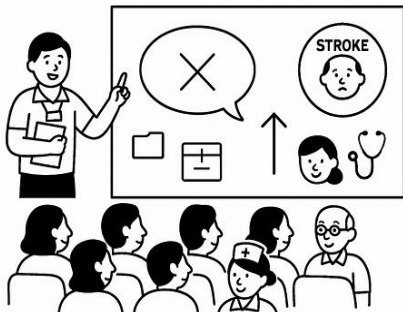
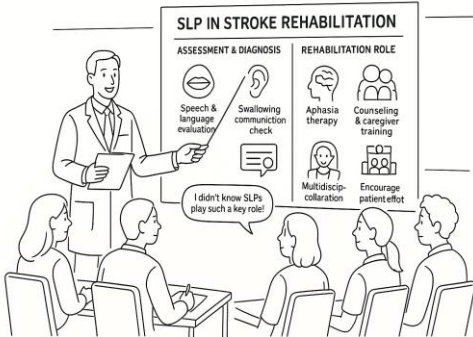
### III. HCPs find it difficult to communicate with stroke patients when they are not aware of its consequences on physical, speech, language, and cognitive deficits in post-stroke conditions

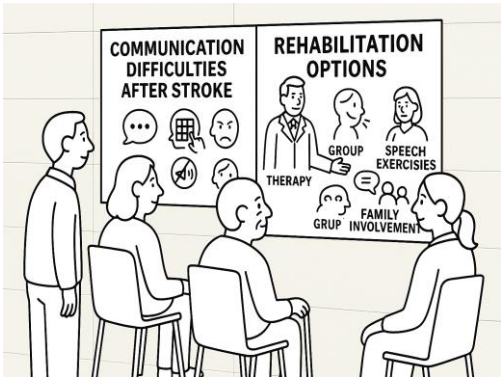
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| 1. | Orientation programs can be conducted for Knowledge on appropriate referral. |  |
| 2. | Training programs can be conducted to develop Awareness.                     |                                                                                     |
| 3. | Train professionals with experience and knowledge to use the material.       |                                                                                     |
| 4. | Can use total communication                                                  |                                                                                     |

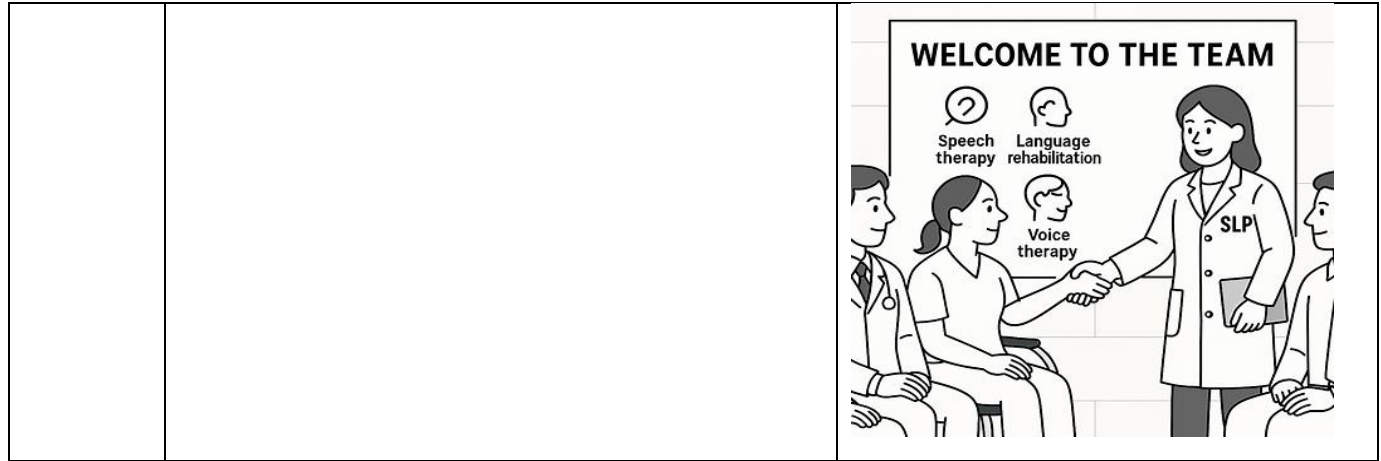
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|                                                                                                                                                                                            |                                                                                    |    |
| <b>IV. HCPs find it difficult to communicate due to a lack of awareness among patients and caretakers about resources or information about managing post-stroke physical disabilities.</b> |                                                                                    |                                                                                      |
| 1.                                                                                                                                                                                         | Pamphlet to educate caregivers                                                     |   |
| 2.                                                                                                                                                                                         | Provide information in caregiver-friendly language during admission and discharge. |  |
| 3.                                                                                                                                                                                         | Create awareness programs and camps for caretakers.                                |                                                                                      |

|                                                                                                                                                                  |                                                  |                                                                                      |
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|                                                                                                                                                                  |                                                  |    |
| 4.                                                                                                                                                               | Medical curriculum about SLPs and their role     |    |
| <b>V. There is a limited awareness about speech-language therapy in India, making it harder for professionals to access appropriate communication breakdown.</b> |                                                  |                                                                                      |
| 1.                                                                                                                                                               | Including SLPs in the team                       |  |
| 2.                                                                                                                                                               | Increase the involvement of SLPs in stroke care. |                                                                                      |
| 3.                                                                                                                                                               | Conducting awareness programs and camps by SLPs  |                                                                                      |

|                                                                                                                               |                                                                                         |                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                               |                                                                                         |                                                                                                                  |
| 4.                                                                                                                            | Awareness-creating videos and pamphlets by SLPs                                         |  <p><b>SPEECH-LANGUAGE PATHOLOGIST</b></p>                                                                      |
| <b>VI. Lack of a speech and language pathologist in the hospital leads to communication difficulties with stroke patients</b> |                                                                                         |                                                                                                                                                                                                    |
| 1.                                                                                                                            | Recruiting more SLPs (full-time, part-time, or for consultation) based on the case load |  <p>recruitment of more SLPs (full-time / part-time / visiting consultants)<br/>based on patient case load</p> |
| 2.                                                                                                                            | Collaboration with tele therapists                                                      |                                                                                                                                                                                                    |

|    |                                                                                                |                                                                                                                                                                    |
|----|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                                                                                |                                                                                  |
| 3. | Training of HCPS about basic communication strategies                                          |                                                                                  |
| 4. | Create awareness programs and camps.                                                           |  <p>Awareness programs on communication difficulties with stroke patients</p> |
| 5. | Medical curriculum talking/including about SLPs and their role in the rehabilitation of stroke |                                                                                |

| VII. Lack of awareness of speech and language rehabilitation for stroke patients with communication difficulties in the hospital setup. |                                                                                                     |                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 1.                                                                                                                                      | Conducting awareness programs                                                                       |    |
| 2.                                                                                                                                      | Posters about communication difficulties in stroke patients and on available rehabilitation options |   |
| 3.                                                                                                                                      | Creating Awareness regarding SLPs among medical professionals                                       |  |
| 4.                                                                                                                                      | Recruitment of SLPs (multidisciplinary approaches) and highlight their role.                        |                                                                                      |



## **APPENDIX 5: Knowledge-based Multiple Choice Questions (MCQs)**

**Name:**

**Age/gender:**

**Profession:**

**Phone Number/Gmail ID:**

**Q1.** Which type of question is most helpful in communication with stroke patients?

- a) Open-ended questions requiring long responses
- b) Yes/No questions
- c) Multiple-choice
- d) Short answer questions

**Q2.** Stroke patients often hesitate to ask about their diagnosis. Which strategy can best encourage them to seek clarification?

- a) Providing information in medical terms
- b) Using simple drawings and visual supports to explain the diagnosis
- c) cut down the information to reduce patient anxiety
- d) Limiting patient involvement in discussions

**Q3.** To ensure stroke patients comprehend treatment protocols, healthcare providers should,

- a) Give extended time and use step-by-step explanations
- b) Deliver all information at once, quickly
- c) Depend entirely on family members to interpret details
- d) Avoid using non-verbal cues like gestures or pointing

**Q4.** Stroke patients may easily forget hospital procedures. Which strategy is most effective in aiding their recall?

- a) Depend solely on caregivers to remember all details
- b) Explain everything only once to avoid confusion
- c) Use only complex medical explanations
- d) Provide frequent reminders and repeat information as needed

**Q5.** Which environmental modification can best reduce communication difficulties for stroke patients?

- a) Maintain a calm and quiet environment during interactions
- b) Conduct conversations in noisy, crowded spaces
- c) Keep the television or radio on for background stimulation
- d) Speak quickly to shorten the interaction

**Q6.** Which method can healthcare providers adopt to ensure stroke patients in rural areas understand the importance of follow-up?

- a) Community-based awareness programs
- b) written materials in English

- c) Relying solely on hospital visits without outreach
- d) Limiting caregiver involvement in communication

**Q7.** Work-related pressures, such as tight schedules and staffing shortages, often make it difficult for HCPs to communicate effectively with stroke patients. Which strategy can help maintain communication quality?

- a) Speaking rapidly without checking for patient understanding
- b) Avoiding communication to save time
- c) Delegating all communication to non-clinical staff
- d) Prioritizing brief but meaningful interactions focused on patient needs

**Q8.** To prevent communication breakdowns due to limited time, healthcare teams should \_\_\_\_\_. Choose the correct option from the below mentioned options.

- a) Coordinate roles and share communication responsibilities among staff
- b) Restrict communication to emergencies only
- c) Avoid involving other professionals in communication
- d) Assume patients understand without verification

**Q9.** Hearing loss in elderly stroke patients often interferes with effective communication. Which strategy can best support understanding?

- a) Speaking loudly without facing the patient
- b) Facing the patient and speaking slowly and clearly
- c) unable to maintain a quiet environment and avoid background noise
- d) Using only written medical notes

**Q10.** To improve communication outcomes for stroke patients in hospitals, healthcare teams should \_\_\_\_\_. Choose the correct option from the below mentioned options.

- a) Delay referral to speech therapy until after discharge
- b) Focus only on medical stabilization and discharge
- c) Ignoring communication goals from rehabilitation plans
- d) Include speech-language pathologists in multidisciplinary care

## APPENDIX 6: Confidence Rating Scale

**Instruction:** Please circle the number that best describes how confident you are about your ability to carry out each of the following aspects of care and communication for stroke patients.

|     |                                                                                                                    | Not at all<br>confident | Somewhat<br>confident | Moderately<br>confident | Very<br>confident |
|-----|--------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------|-------------------------|-------------------|
| 1.  | I can communicate effectively with stroke patients.                                                                | 1                       | 2                     | 3                       | 4                 |
| 2.  | I can communicate effectively with stroke patients during a comprehensive assessment.                              | 1                       | 2                     | 3                       | 4                 |
| 3.  | I can assist stroke patients in clarifying treatment goals.                                                        | 1                       | 2                     | 3                       | 4                 |
| 4.  | I am empathetic toward stroke patients.                                                                            | 1                       | 2                     | 3                       | 4                 |
| 5.  | I can handle stroke patients' emotional and psychological issues.                                                  | 1                       | 2                     | 3                       | 4                 |
| 6.  | I am able to assist stroke patients in developing lifestyle modifications after stroke.                            | 1                       | 2                     | 3                       | 4                 |
| 7.  | I can handle time and work-related difficulties.                                                                   | 1                       | 2                     | 3                       | 4                 |
| 8.  | I can seek support from other professionals to overcome communication, knowledge, time, and work-related barriers. | 1                       | 2                     | 3                       | 4                 |
| 9.  | I can create awareness programs on Stroke rehabilitation.                                                          | 1                       | 2                     | 3                       | 4                 |
| 10. | I am able to provide information and educate stroke patients and their caregivers on Stroke rehabilitation         | 1                       | 2                     | 3                       | 4                 |