

**CLINICAL TUTORIAL ON CLUTTERING FOR SPEECH-LANGUAGE  
PATHOLOGISTS**

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**A Dissertation Submitted in Part Fulfilment of Degree of Master of Science**

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**University of Mysuru**

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**September 2021**

## **CERTIFICATE**

This is to certify that this dissertation titled “**Clinical Tutorial on Cluttering for Speech-Language Pathologists**” is a bonafide work submitted in part fulfilment for the degree of Master of Science (Speech-Language Pathology) by the student holding Registration Number: 19SLP013. This has been carried out under the guidance of a faculty member of this institute and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

Mysuru.

September, 2021

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## DECLARATION

This is to certify that this dissertation entitled “**Clinical Tutorial on Cluttering for Speech-Language Pathologists**” is the result of my own study under the guidance of Dr. Sangeetha Mahesh, Associate Professor and Head, Department of Clinical Services, All India Institute of Speech and Hearing, Mysuru, and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

Mysuru.

September, 2021

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*Dedicated to...*  
*My loving parents*  
*Dearest Cathy*  
*And to those who seek to understand*  
*Cluttering.*

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## CHAPTER I

### INTRODUCTION

The term 'tutorial' as per the dictionary, refers to a book or a program that provides adequate information on a particular topic. It often helps to give sufficient support in understanding a specific subject for the intended audience. It supplements a platform for the students and concerned professionals to better understand the subject, especially in the rehabilitation field, where hands-on experience in certain disorders for the clinician can be limited. The variety of questions included, ranging from easy to complex, provides immediate feedback on the student's performance.

Fluency of speech involves a smooth flow of information and speech. Often, slight breakdowns in this flow go unnoticed; even a well-articulated orator can fumble up. Disorders of fluency include developmental stuttering, acquired stuttering, and cluttering (Ward, 2006). Stuttering has been given more importance throughout history than cluttering; therefore, the literature on cluttering is comparatively lesser. According to Weiss (1964) and Daly (1993), cluttering was initially considered an orphan of speech pathology. It was in recent decades, due to increased awareness and researches, fluency disorder included cluttering.

Cluttering can affect both the speech and language aspects of an individual. Though some of the speech aspects are similar to stuttering, some elements help differentiate it from stuttering. However, research to spot the features essential to identifying the disorder as cluttering or stuttering-cluttering is still going on. In the recent decade, St. Louis and Schulte (2011) gave the 'Lowest common denominator' definition that includes the

standard cluttering characteristics considered by clinicians and researchers. According to them,

"Cluttering is a fluency disorder wherein segments of conversations in the speaker's native language typically are perceived as too fast, too irregular, or both. The segments of rapid and/or irregular speech rate must further be accompanied by one or more of the following: (a) excessive 'normal' disfluencies; (b) excessive collapsing or deletion of syllables; (c) and/or abnormal pauses, syllable stress, or speech rhythm."

Cluttering is a relatively less frequently occurring speech disorder and often co-occurring with other conditions such as learning disability, Down Syndrome, etc. Identifying, assessing and treating persons with cluttering (PWC) can become a challenge for clinicians, due to the limited clinical exposure despite gaining theoretical knowledge during the speech-language pathology course.

Blanchet et al. (2015) conducted a survey in university students, in which one group was provided only with definition and another group had a video demonstration of cluttering along with definition. The students, were then asked to fill the survey assessing whether they can identify themselves or others they are acquainted with or related to as, person with stuttering (PWS), person with cluttering (PWC) or person with cluttering and stuttering (PWCS). Their results supported that even without formal training or experience in speech-language pathology, one can identify fluency disorders (St Louis et al., 2010). However, the group receiving only the definition of cluttering identified significantly higher individuals with fluency disorders. The authors speculated that this could be due to overestimation, as they may have considered 'fast rate of speech' alone to identify PWC. This suggests that, despite gaining knowledge on cluttering in theory during the speech-

language pathology course, there can be issues while assessing, diagnosing and treating PWC due to the lack of clinical exposure among speech-language pathology students.

**Need for the study:**

Cluttering is a multifaceted condition in which multiple domains are affected, involving the linguistic and motoric components. Due to the previously limited research on cluttering, identification based on speech-language pathologists' observed characteristics is sometimes difficult.

One of the complicating factors in identifying and treating cluttering is because it frequently coexists with other disorders and a low prevalence of 'pure cluttering'. According to Ward (2006), stuttering is the most common to exist along with cluttering. Cluttering has also been found to be present along with disorders such as ADHD (Daly, 1992; Molt, 1996); Down syndrome and Fragile X syndrome (Van Borsel & Tetnowski, 2007) etc. 'Pure cluttering' according to several researchers is rare, occurring in almost 5-16% of disfluent children (Baker, 2005; St. Louis & McCaffrey, 2005). In a review by Preus in 1992, the mean prevalence of cluttering-stuttering was observed as 35%. In an AIISH funded ARF project, Survey of fluency disorders carried out by Geetha, Y. V. and Sangeetha, M. (2014-2015), analyzed five years data on fluency disorders from 2010-2014, 96.8% of the individuals were identified as PWS, 0.2% as cluttering-stuttering, 0.5% as PWC and 0.4% as neurogenic stuttering. Van Zaalen, et al. (2011) hypothesize that cluttering increases during adolescence as there is an increase in linguistic and motor demands for communication; hence cluttering often remains unidentified till ten years of age.

Even though there is an increase in awareness about cluttering among the general population and speech-language pathology students, there remains a dearth in PWC compared to stuttering, primarily due to the limited prevalence of cluttering. Also, the hours in theory allotted for cluttering during the undergraduate course (B.ASLP) is around 3-4 hours and 5-6 hours in postgraduate years of training (M.SLP). This is comparatively less, as around 24 hours during undergraduate training (B.ASLP) and 56 hours in postgraduate level (M.SLP) are allotted for stuttering. Research suggest that despite gaining some knowledge on cluttering in theory during the speech-language pathology course, there can be issues while assessing, diagnosing and treating PWC due to the lack of clinical exposure among speech-language pathology students (Blanchet et al., 2015)

This tutorial is put forth with the focus to strengthen the clinical aspects of cluttering, with the help of case history or samples of PWC available in OPD at All India Institute of Speech and Hearing (AIISH). It is to help speech-language pathologists to get a clearer understanding of cluttering. This tutorial will elaborate on how to identify the features of cluttering; how to assess with regard to the rate, articulation, fluency and language; how to treat PWC. This will, therefore help speech-language pathologists to handle PWC with more confidence.

**Aim of the study:**

The primary aim of the present study is to develop a clinical tutorial for speech-language pathologists on an overview of cluttering

**Objectives of the study:**

1. To develop a clinical tutorial on cluttering for speech-language pathologists.
2. To validate the content of the tutorial using validation questionnaire adapted from Aphasia Treatment Manuals (Goswami et al., 2010)
3. To compare the knowledge on cluttering between prospective speech-language pathologists and experienced speech-language pathologists.

## CHAPTER II

### REVIEW OF LITERATURE

Communication is an essential part of one's life. Individuals use different ways to communicate information. Of which speech is the most common way. Being able to communicate effectively using speech, one needs good articulation, fluency and voice. Fluency of speech involves a smooth flow of information and speech. Often slight breakdowns in this flow go unnoticed; even a well-articulated orator can fumble up.

Disorders of fluency include developmental stuttering, acquired stuttering and cluttering. Developmental stuttering arises in childhood and can persist into adult years. It is one of the common fluency disorders and has multifactorial reasons. Acquired stuttering occurs in adulthood, and is comparatively rare. It can be of two types. Neurogenic stuttering, arising due to some damage to the nervous system and psychogenic stuttering, arising due to some traumatic experience (Ward, 2006). Cluttering can affect both the speech and language aspects of an individual. Though some of the speech aspects are similar to stuttering, some elements help differentiate it from stuttering. Compared to developmental stuttering, research on acquired stuttering and cluttering is limiting.

#### ***Brief history on cluttering***

Throughout history, research on cluttering was quite limited and included in stuttering as a disorder of fluency. It was considered a stepchild or orphan among the different speech-language pathology disorders (Weiss, 1964) and a relative of stuttering (Eisenson, 1986).

Swiss physician Bazin (1717) was the first to hypothesize that cluttering was related to the thinking process. Isère (1849) of France, was the first who identified the symptoms of cluttering (*bredouillement*) most precisely. Hunt (1861), from the Great Britain, described additional features differentiating stuttering and cluttering and is considered the person who coined the term cluttering (as cited in Reichel et al. 2013).

Weiss in his classic text on cluttering (1964), therefore pointed out that cluttering was not ignored completely and that throughout history, cluttering was discovered by different authors, with different terms for the identifying symptoms. Terms such as *poltern* (disorderly noise, German), *hadaras* (hurried speech, Hungarian) *agitophasia* (excited speech, Latin), *tartagliare* (repetitiousness, Italian), *bafouillement* (talking in circles, French), *tachyphemia* (quick speech, latin), etc., were commonly used. The word ‘cluttering’ was used more often by British therapists in the 19th century. However, the various countries worldwide, still use different terms such as *broddelen* (Dutch), *getkot* (Polish), etc.,

### ***Various attempts to define cluttering***

Van Riper (1992) reported that in the case of cluttering, we are all still lost in woods. His statement may have raised due to the several attempts made to define cluttering during the earlier decades. Such a universal disagreement in defining cluttering could have been due to the heterogeneous nature (Op’t Hof & Uys, 1974) and the fact, that cluttering rarely occurs as a pure disorder. Froeschels (1946) defined cluttering as a condition where speech occurs quicker than thought process. Luchsinger (1955), considered cluttering to be a problem in word-finding. De Hirsch (1961) suggested cluttering to be a form of dyspraxia, a motor integration disturbance. Weiss (1964) described the disorder as a central language



imbalance having obligatory (lack of awareness of speech problems, perceptual weakness, etc.), facultative (not always observed such as tachylalia, interjections, etc.) and associated symptoms (accompanying symptoms not specific to cluttering such as reading writing difficulties, etc. Luchsinger and Arnold (1965) proposed cluttering to involve formulation of language disability resulting in tachyphemia (hurried speech), confused and slurred articulation. Diedrich (1984), however, argued that there is an issue in self-monitoring resulting in difficulty in maintaining articulatory units in sequence, often with the individual having little consciousness about their difficulty.

A synergistic viewpoint was used by Myers (1992) to describe cluttering, in which rate, language, fluency and articulation are affected, worsened by poor self-monitoring abilities

In the recent decade, St. Louis and Schulte (2011) gave the 'Lowest common denominator' definition that includes the standard cluttering characteristics considered by clinicians and researchers. According to them,

"Cluttering is a fluency disorder wherein segments of conversations in the speaker's native language typically are perceived as too fast, too irregular, or both. The segments of rapid and/or irregular speech rate must further be accompanied by one or more of the following: (a) excessive 'normal' disfluencies; (b) excessive collapsing or deletion of syllables; (c) and/or abnormal pauses, syllable stress, or speech rhythm."

### ***Prevalence***

In a review by Preus in 1992, the mean prevalence of cluttering-stuttering was observed as 35%. In an AIISH funded ARF project, Survey of fluency disorders (2014-

2015), analyzed five years of data on fluency disorders from 2010-2014, 96.8% of the individuals were identified as PWS, 0.2% as cluttering-stuttering, 0.5% as PWC and 0.4% as neurogenic stuttering. Van Zaalén, Wijneen, and Dejonckere (2011) hypothesize that cluttering increases during adolescence as there is an increase in linguistic and motor demands for communication; hence cluttering often remains unidentified till ten years of age.

### *Characteristics*

The lack of universal agreement among the authors, due to the disorder's heterogeneous nature, often leads to complications in identifying specific symptoms to diagnose and differentiate it. The years of research conducted on persons with cluttering have however, put forward some symptoms observed for diagnosis

1. Rapid or irregular rate of speech. Progressively increasing speech rate (festinating speech) (St. Louis & Schulte, 2011; Daly & Cantrell, 2006).
2. Normal disfluencies: interjections, revisions, phrase repetitions, monosyllabic whole-word repetitions (Scott, 2020; St. Louis & Schulte, 2011; Oliveira et al., 2010)). The ratio of nonstuttering like disfluencies to stuttering like disfluencies should be 1.7 or higher (van Zaaelen, 2009b)
3. Over-coarticulation, Telescoping or condensing words (Scott, 2020; St. Louis & Schulte, 2011; Daly & Cantrell, 2006)
4. Abnormal and short pauses: (Bona, 2016; Daly, 2006; van Zaaelen & Reichel, 2005)
5. Lack of awareness of speech problems (Daly, 2006; St. Louis & Hinzman, 1986; Weiss, 1964)

6. Poor self-monitoring abilities (Myers, 1992; Diedrich, 1984)
7. Cluttering can affect both the speech and language aspects of an individual (Ward, 2006; Van Zaleen op't Hof et al., 2011). Ward (2006) speculated two types of cluttering to exist: motoric and a linguistic type (affecting syntactic, semantic, pragmatic processing)
8. Van Zaleen op't Hof et al. (2011) highlighted that linguistic difficulty play a significant role in PWC's disfluencies. They labelled these disfluencies as "linguistic maze behaviours." These behaviours include word-finding problems, impaired syntactic structure and impaired pragmatic abilities.
9. Ward (2006) identified that lexical access difficulty, discourse difficulties and affected working memory in PWC.
10. Poor story retelling skills (van Zaaelen, 2009b)
11. Motor coordination and writing problems (van Zaaelen et al., 2009 ;Daly, 2006)

An interesting observation made by several authors about cluttering is that, unlike in stuttering, the person with cluttering is observed to have fluent and better articulated speech when they pay attention to task. (Bona, 2012; van Zaaelen, 2009) hence, the characteristics diagnosing as cluttering can be difficult to observe under laboratory conditions.

### ***Assessment***

Assessment of cluttering, should include assessing the various cluttering elements such as speech rate, articulation, speech fluency, language, intelligibility and rhythm.

St. Louis et al. 2013 cited that due to inappropriate pauses among speech, speech may appear to be at slower rate. Hence, speech rate can be assessed using syllables per

second. Oral examination, oro motor abilities examination (diadochokinetic rates), automatic speech, spontaneous speech can be used to assess articulation. Abnormal pausing, lack of coherence, word-finding problems, increased normal disfluencies should also be observed and noted during their speech. The person with cluttering should also be asked to give a written sample as in some cases, writing mimics the speech difficulties (illegible writing, careless spelling errors, etc.). Non speech motor control should also be assessed.

Such a comprehensive assessment will give us a better and more precise understanding of the PWC. The various checklists and inventories available that can help in the assessment include Predictive Cluttering Inventory- revised (PCI) (Van Zaalen et al., 2009); Computer Aided Assessment of Cluttering Severity: Cluttering Assessment Program (Bakker, 2005); Checklist of cluttering behavior (Ward, 2006). Tasks can include oral reading, story retelling and spontaneous speech sample, preferably videotaped (Ward, 2006).

**Table 2.1**

*List of materials available to assess cluttering*

<b>Sl. No.</b>	<b>Name of material</b>	<b>Author</b>	<b>Components</b>
1.	Predictive Cluttering Inventory- Revised (PCI)	van Zaalen et al., 2009	Pragmatics; speech motor; language and cognition; motor coordination and writing problems

2.	Computer Aided Assessment of Cluttering Severity: Cluttering Assessment Program (CLASP)	Bakker, 2005	Quantified assessment and qualitative assessment portion (cluttering severity rating, percent talk time cluttered )
3.	Self-Awareness of Speech Index	St. Louis & Atkins, 2006	Oral motor problems /general coordination, central auditory problems, handwriting, math skills reading comprehension and spelling,
4.	Checklist of cluttering behavior	Ward, 2006	Speech rate and fluency; articulation; language and linguistic fluency; disorganized thinking; writing; attention; other nonverbal attributes

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An essential point to be kept in mind is that, unlike stuttering, cluttering does not have any associated secondary behaviors. Even if present, the behavior is observed due to poor communication skills and not due to disfluency moments.

One of the complicating factors in identifying cluttering is because it frequently coexists with other disorders and there is a low prevalence of ‘pure cluttering’. According to Ward (2006), stuttering is the most common to exist along with cluttering. Cluttering has also been found to be present along with disorders such as ADHD ( Daly, 1992; Molt, 1996); Down syndrome and Fragile X syndrome (Van Borsel & Tetnowski, 2007), etc. ‘Pure cluttering’ according to several researchers is rare, occurring in almost 5- 16% of

disfluent children (Baker, 2005; St. Louis & McCaffrey, 2005). In an AIISH funded ARF project, Survey of fluency disorders (2014-2015), analyzed five years of data on fluency disorders from 2010-2014, 96.8% of the individuals were identified as PWS, 0.2% as cluttering-stuttering, 0.5% as PWC and 0.4% as neurogenic stuttering.

### ***Treatment***

Myers (1992) suggests using a synergistic approach involving improvement in fluency, rate, rhythm, articulation, language and self-monitoring. St. Louis and Myers (1997), outlined that synergism consists of the coordination of different components essential for communication. The authors explained that the components are interrelated, such that discourse coherence can be affected when the rate is too fast. Hence, improvement in one aspect, inevitably improves others. As cluttering is a multifaceted disorder, it is essential for an individualized treatment plan for each client. However, the goal should start from self-awareness.

In their article, Van Zaalen and Reichel (2014) put forth a cluttering treatment plan that includes 4 phases. Since the PWC is often unaware of his/her condition, which can prove to be a difficulty during further treatment, the initial phase includes identification of the symptoms by the PWC. The next phase involves speech rate reduction using syllable tapping, training using audio-visual feedback; moving to 'a conscious decision' of the client to maintain the required articulatory rate to maintain fluency and intelligibility; appropriate pausing. Phase 3 involves self-monitoring of speech by PWC. The last phase consists in improving narrative skills to help communicate in tasks of different levels of complexity. Preus (1986) recommends using fluency shaping and stuttering modification approaches for intervention in case of cluttering-stuttering. Ward (2004), suggested a pyramidal model

of narrative structure to improve the length and complexity of utterance. Starting from concise utterances, there is a stepwise increase in length and syntactic structure. Through this approach, the sequencing of verbal information can also be worked upon.

***Available literature on cluttering***

Materials available on cluttering are comparatively less than stuttering and other speech and language disorders. The below mentioned, are some available literature on cluttering.

**Table 2.2**

*Some books available on cluttering*

<b>Material</b>	<b>Author</b>	<b>Description</b>
<b>Stuttering and cluttering – Framework for understanding and treatment</b>	Ward (2017)	Provides detailed information on the nature of cluttering (chapter 8) (definitions, etiology, characteristics, development of cluttering, the difference from stuttering ) and assessment, diagnosis and treatment of cluttering (chapter 18)
<b>Cluttering – a handbook of research, intervention and education</b>	Ward & Scott (2011)	17 chapters contributed by different international authors are compiled, providing detailed information on cluttering. Chapters include etiology, co-occurring disorders (stuttering, Down syndrome, learning disabilities, autism

spectrum disorders), assessment, treatment, the importance of self-help and support groups, current and future directions, cluttering in academic curriculum. Some of the notable authors included are Bakker, Davis, Myers, Scott, van Zaalen, Ward, etc.,

<p><b>Stuttering</b> - an integrated approach to its nature and treatment</p>	<p>Guitar (2013)</p>	<p>Provides brief information on nature, assessment, diagnosis and treatment for cluttering (chapter 15); the chapter also provides a comparison between developmental, neurogenic, psychogenic stuttering and cluttering characteristics</p>
<p><b>Cluttering</b> – current views on its nature, diagnosis and treatment</p>	<p>van Zaalen &amp; Reichel (2015)</p>	<p>The book consists of 6 chapters, providing detailed information on the theoretical background (definition, history, incidence, prevalence, models, public awareness and attitudes), symptoms, characteristics, diagnostic criteria, differential diagnosis and treatment of cluttering</p>

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**Table 2.3***Recent articles published on cluttering*

<b>Title</b>	<b>Author</b>	<b>Year</b>	<b>Journal</b>
Perceptions of cluttering among communication sciences and disorders and non-communication sciences and disorders students	Blanchet & Synder	2017	Perspectives of the ASHA Special Interests Groups
Disfluent whole-word repetitions in cluttering: Durational patterns and functions	Bona	2018	Clinical linguistics and phonetics
Cluttering symptoms in school-age children by communicative context: A preliminary investigation	Scott	2020	International journal of speech-language pathology
Rate vs. rhythm characteristics of cluttering with data from a “syllable-timed” language	Bona & Kohari	2021	Journal of fluency disorders
Self-initiated error-repairs in cluttering	Bona	2021	Clinical linguistics and phonetics
Changing Polish university student’s attitudes toward cluttering	Wesierska et al.	2021	Journal of fluency disorders

**Table 2.4**

*Dissertation done in AIISH on cluttering*

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<b>Title</b>	<b>Author</b>	<b>Year</b>	
Cognitive-linguistic skills in persons with cluttering and stuttering	Pankaja Guide: Sangeetha Mahesh	2015	Provides insight into cognitive-linguistic abilities in PWC, PWS and PWCS. It was found that PWC scored lower in language domain and high in visuospatial skills when assessing using Cognitive Linguistic Quick Test - Kannada (CLQT-K). One of the three participant had poor performance in story telling tasks, indicating difficulty in attention, memory and language domain.  The finding suggest a definite language deficit observed in cluttering.

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Even though there is an increase in awareness about cluttering among the general population and speech-language pathologists, there remains a dearth in PWC compared to stuttering, primarily due to the limited prevalence of cluttering. Also, the hours in theory allotted for cluttering during the undergraduate course (B.ASLP) is around 3-4 hours and 5-6 hours in postgraduate years of training (M.SLP) is comparatively less

Research suggests that despite gaining some knowledge on cluttering in theory during the speech-language pathology course, there can be issues while assessing, diagnosing and treating PWC due to the lack of clinical exposure among speech-language students (Blanchet et al., 2015).

This tutorial is put forth with the focus to strengthen the clinical aspects of cluttering with the help of case history or samples of PWC available in OPD, to get a clearer understanding of cluttering.

## CHAPTER III

### METHOD

The present study was aimed to develop an audio-video tutorial on cluttering for speech-language pathologists (SLPs), to improve their knowledge on various aspects of cluttering, which would in turn help them to deal with assessment, diagnosis and treatment for persons with cluttering (PWC) with more confidence. This study was also designed to evaluate the knowledge on cluttering and efficacy of the audio-video tutorial between prospective and experienced SLPs.

The development of the tutorial was carried out in two phases.

**Phase I:** Development of the tutorial, which was undertaken in the following steps

#### *Preparation of the script*

For the purpose of the tutorial, a script was prepared, which included various aspects of cluttering. The content of the script was explored from text books, articles, videos and other information from internet source. Relevant themes such as etiology, general characteristics, assessment, differential diagnosis and management were included (Appendix 1). The script was prepared in such a way that all relevant topics were covered and appropriate examples could be provided in video when needed. In the script, the segments that required speaker's narration, text slides and appropriate pictures and videos with appropriate time line is also mentioned.

### *Video recording*

The audio-video recording was recorded by the SLP using a tripod stand and an iPhone 8. A silent room with minimum background noise and adequate lighting was chosen for the recording. The SLP was video recorded with her entire head and neck and a portion of the background. Short segments of 3-5 minutes were recorded at a time. The visual effects, such as required illumination, angle of the shots and aspect ratio was taken care of. Whenever needed, re-recording was done. In case of therapy related videos, Zoom app was used and recorded using inbuilt microphone and camera in Dell Vostro 3000 laptop.

### *Post recording process/ Preparation of the pre-final video*

After the completion of the video recording segments, the editing of the pre-final video was done using video editing software using IMovies app. Pictures of general case history and assessment tools, case examples with analysis for specific characteristic and few therapy related videos were also added. Two question answer sections were included to ensure better understanding of cluttering. The tutorial included speaker's narration, text slides and appropriate pictures and videos, merged and edited based on the script board. The edited materials were arranged in such a way, that the tutorial was organized into an easy and comprehensible manner. Subtitles and keywords were also merged with the video at the appropriate time line to be in sync with narration.

### *Evaluation of pre-final video by speech-language pathologists*

The developed video tutorial were given to three experienced SLPs. The SLP's were asked provide feedback after viewing the video tutorial with respect to the audio,

video, content, presentation and other technical aspects to improve the tutorial. They were provided with the validation questionnaire, adapted from Feedback Rating Questionnaire in Field Testing of MANAT-K (Goswami, Shanbal, Navitha & Samasthitha, 2010) (Appendix II). The validation questionnaire consisted of 12 parameters and SLP's had to rate using a 5-point rating scale from very poor to excellent. The questionnaire also consisted of an additional column to write any additional remarks and comments.

#### *Preparation of final video*

Following the evaluation, SLP's feedback and suggestions was integrated into the pre-final video. Modifications were made to the pre-final video in the appropriate places, which included, adding subtitles for few of the case examples, reducing duration for question answer sections, etc. Ultimately, the final video of 52 minutes was ready to be shown to the participants.

**Phase II:** Field testing of the audio-video tutorial, which included the following steps

#### *Development of questionnaire for evaluation of developed video tutorial*

A questionnaire was simultaneously developed to assess the effectiveness of the audio-video tutorial. The questionnaire consisted of 25 multiple choice questions (Appendix III). The questionnaire included questions from various sections such as clinical characteristics, etiologies, assessment, differential diagnosis and treatment of cluttering. The questionnaire was also given for evaluation to the three SLP's using the validation questionnaire. Required modifications was made to the final questionnaire before

administration. The questionnaire was administered on the participants before and after viewing the audio-video tutorial.

### *Selection of participants*

Prospective and experienced SLPs were considered as the participants for the present study. The participants were divided into two groups, group A (prospective SLPs) and group B (experienced SLPs). Total of ten participants participated in the study. Group A consisted of five prospective SLPs and group B consisted of five experienced SLPs. Prospective SLPs include undergraduate and postgraduate students of the speech, language and hearing discipline studying in All India Institute of Speech and Hearing (AIISH), Mysuru. Experienced SLPs include SLPs who have minimum of 1 year of clinical experience. The details of the participants have been provided in the Table 3.1 and Table 3.2.

**Table 3.1**

### *Details of participants in Group A*

<b>SI. No</b>	<b>Age/gender</b>	<b>Year of course</b>
1	21/F	II B.ASLP
2	22/F	III B.ASLP
3	23/F	Intern B.ASLP
4	24/F	II M.Sc SLP
5	24/F	II M.Sc SLP

**Table 3.2***Details of participants in Group B*

<b>SI. No</b>	<b>Age/gender</b>	<b>Qualification</b>	<b>Years of clinical experience</b>
1	24/F	B.ASLP	1 year
2	28/F	B.ASLP	1 year
3	29/F	B.ASLP	3 years
4	25/F	M.Sc SLP	1 year
5	27/F	M.Sc SLP	2 years

*Procedure*

Considering present pandemic condition, a google form was created which included separate pretest and posttest questionnaire and google drive link to the audio-video tutorial. This was sent to all participants through WhatsApp app and email (Appendix IV). The participants were asked to complete the pretest questionnaire, followed by viewing the video and then carry out the posttest questionnaire. The pretest google form consisted of three sections: demographic details, 25 MCQs related to cluttering and link to the video. The posttest mainly consisted demographic details and 25 posttest MCQs. Participants were asked to mark the correct options in the appropriate columns in the google form. They were given thirty minutes to submit the pre-test questionnaire. After watching the 52 minutes' audio-video tutorial they were given another thirty minutes to submit post-test questionnaire.



### *Scoring*

After administering the questionnaire, the pre-test and post-test questionnaires answers was evaluated by a SLP. Each correct answer was given one mark and each incorrect answer was given zero. The total scores were calculated separately for both pretest and posttest. No negative marking was given. Total mark out of twenty five was calculated.

### *Evaluation of results*

The scores calculated were compared and tabulated for further statistical analysis using Statistical Package Social Sciences (SPSS Version 25). Wilcoxon Signed Ranks test was used to compare pre and post questionnaire scores within each group. Mann-Whitney test was carried out to compare the scores between the two groups.

## CHAPTER IV

### RESULTS AND DISCUSSION

The present study was designed to develop and validate an audio-video tutorial on cluttering. This tutorial was developed for both prospective and experienced speech-language pathologists (SLPs) to help them handle diagnosis, assessment and treatment of PWC with more confidence. A total of five prospective SLPs and five experienced SLPs participated in the study.

#### **Phase 1:** Development of the tutorial

#### *Qualitative analysis by experienced SLPs about the overall effectiveness of the audio-video tutorial*

The script was given to two experienced SLPs. They viewed the script and provided feedback to improve the video. Some of the corrections suggested by them were:

- Correction of few spelling errors
- Rephrase few lengthy sentences
- Include more information for the study mentioned in the etiology
- Highlight important keywords
- Add information on case history
- Provide subtitles for two of the case samples (story retelling and awareness)
- Include picture and video references in the end

Given below is a sample of the script. The complete script is included in the Appendix (Appendix III).

**Table 4.1**

*Sample script prepared for the video recording*

	<b>Visual</b>	<b>Audio</b>
1	<p><i>Opening</i></p> <p>Logo of AIISH followed by</p> <p>Dissertation title- Clinical Tutorial on Cluttering for Speech-Language Pathologists</p> <p>Student name- Ms. Joel Joseph</p> <p>Student registration number- 19SLP013</p> <p>Guide's name- Dr. Sangeetha Mahesh</p> <p>Guide's designation- Associate professor and Head, Department of Clinical Services</p> <p>All India Institute of Speech and Hearing</p>	<p>Clinical Tutorial on Cluttering for Speech-Language Pathologists</p> <p>This tutorial is developed as part of Masters dissertation under the guidance of Dr. Sangeetha Mahesh, Clinical reader and Head, Department of Clinical Services, All India Institute of Speech and Hearing</p>
2	<p><i>Introduction</i></p> <p>Visual of speaker speaking</p>	<p>Fluency of speech involves a smooth flow of information and speech. Often slight breakdowns in this flow go unnoticed; even a well-articulated orator can fumble up. Disorders of fluency include developmental stuttering, acquired stuttering, and cluttering. (Ward, 2006).</p>



	typically are perceived as too fast, too irregular, or both. The segments of rapid and/or irregular speech rate must further be accompanied by one or more of the following: (a) excessive 'normal' disfluencies; (b) excessive collapsing or deletion of syllables; (c) and/or abnormal pauses, syllable stress, or speech rhythm."
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The earlier mentioned suggestions were incorporated into the pre-final tutorial. The tutorial consisted of definition, etiology, characteristics, assessment and treatment sections. This modified tutorial was then given to three experienced SLPs. They were provided with the validation questionnaire adapted from Feedback Rating Questionnaire in Field Testing of MANAT-K (Goswami, et al., 2010).

**Table 4.2**

*Responses of the SLPs regarding the tutorial*

Sl. No	Parameters	Very Poor	Poor	Fair	Good	Excellent
1	Simplicity	-	-	-	1	2
2	Size	-	-	1	1	1
3	Color and appearance	-	-	-	1	2
4	Presentation	-	-	-	2	1
5	Volume	-	-	-	2	1
6	Relevance	-	-	-	2	1
7	Iconicity	-	-	1	1	1
8	Accessibility	-	-	-	2	1
9	Trainability	-	-	-	1	2
10	Publication, outcomes and developers		Yes			No
			-			3

11	Questionnaire	-	-	-	2	1
12	Coverage of parameters	-	-	-	1	2

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It is evident from the Table 4.2 that two professionals rated the tutorial as “excellent” on the simplicity, color and appearance, trainability and coverage of parameters. One of the SLP rated “excellent” for size, presentation, volume, relevance iconicity, accessibility and questionnaire. Presentation, volume, relevance, accessibility and questionnaire were graded as “good” by two of the professionals. One SLP graded simplicity, size, color and appearance, iconicity, trainability and coverage of parameters as “good”. One professional rated the manual as “fair” on the iconicity and size. All three professionals were not aware of any other resource material similar to this video tutorial available for cluttering.

Two of the SLP provided feedback that the tutorial was informative and covered most of the aspects in cluttering. The sections were clear and organized well. The case samples and writing sample pictures were appropriate. One professional commented to change font size for one of the video segment. She also suggested to include author’s name for the ARF projects. Another professional suggested to change few options in the questionnaire and to arrange it in segments.

Consequently, it can be stated that this tutorial received rating from excellent to good in most of the parameters from the three professionals. Therefore, they were of the opinion that this tutorial contained relevant information on cluttering and can be used effectively for training purposes for prospective and experienced SLPs.

The suggestions and feedback by the content validators for the pre-final video were considered, and the final audio video tutorial was made.

### ***Contents of the final audio-video tutorial***

The overall tutorial is about 52 minutes long. The tutorial begins with objectives of the study, an introduction to cluttering and etiology.

The second section provides information about the informal assessment that can be carried out, starting from case history information collected from the client and his/her communication partners. This is followed by a brief description of the characteristics observed in PWC and related case samples. Information concerning how to analyze the characteristics is also provided. The case samples demonstrating the characteristics were obtained from the audios and videos of PWC available in Fluency unit, AIISH. A short YouTube video on how to calculate rate was included for better understanding. The section also contained information on coexisting conditions. Another YouTube video involving Ward, an expert in cluttering and two PWC, was additionally included to provide a summary of characteristics.

Following this, a question answer section was included with five fill in the blanks. The questions and answers were displayed on screen for around ten seconds with no narration.

The fourth section was on assessment tools and checklist that are available for assessing and profiling the characteristics of PWC across multiple domains. Information regarding the tests and scoring was given for Predictive Cluttering Inventory-Revised,

Cluttering Severity Instrument, Stuttering Severity Index and Self-Awareness of Speech Index.

The fifth section included a table that lists the ten differences between cluttering and stuttering, which would help in differentially diagnosing the two conditions. A YouTube video with Ward and St Louis, two expert in the field of cluttering and one PWC, was also included to summarize the features that differentially diagnose cluttering and stuttering.

The sixth section consisted information on treatment for PWC. A synergistic approach involving improvement in fluency, rate, rhythm, articulation, language and self-monitoring is most suitable for treatment. Few activities for these goals were mentioned in the tutorial. Three therapy videos were also included in the tutorial, wherein a I B.ASLP enacted the role of a PWC and SLP took the clinician's role. A short YouTube video providing information on Delayed Auditory Feedback (DAF) was also included.

The next section again, was a question answer section which included four fill in the blanks and one descriptive question. The questions and answers were displayed on screen for around ten seconds with no narration.

The final section consisted of the conclusion, a brief mention on how the video can serve as a reference for speech-language pathologists to handle PWC. This was followed by references for the pictures and YouTube videos included in the tutorial.

The final audio-video tutorial is saved in DVD and included in the end of this book.



## **Phase II:** Field testing of the audio video tutorial

### *Quantitative analysis of effectiveness of the audio video tutorial on knowledge of cluttering among prospective and experienced SLPs*

As part of this phase, a total of ten participants were selected. Group A consisted of five prospective SLPs and group B consisted of five experienced SLPs. Each participant had to complete pretest questionnaire (before viewing the tutorial) and posttest questionnaire (after viewing the tutorial). The scores were calculated for each participant. Data was tabulated and statistically analyzed using SPSS Version 25. Since the sample size collected was small, test of normality was not carried out and non-parametric tests were incorporated. Wilcoxon Signed Ranks test was used to compare pre and post questionnaire scores within each group. Mann-Whitney test was carried out to compare the scores between the two groups.

The results of the quantitative analysis are discussed under the following sub headings:

#### ***1. Comparison of pretest and posttest questionnaire scores within SLPs***

The pretest and posttest score of all ten participants together was considered. Statistical analysis was carried out using the Wilcoxon Signed Ranks test. The results revealed a significant difference between the pretest and posttest questionnaire scores within SLPs ( $|Z| = 2.82$ ,  $p < 0.01$ ). It is evident that the video tutorial helped to improve score and knowledge on cluttering.

**Table 4.3**

*Comparison of pretest and posttest questionnaire scores within SLPs*

	<b>Pre – Posttest Score</b>
Z	2.82
Asymp. Sig. (2-tailed)	.005*

*Note.* \* = **Significant difference at 0.01 level**

Among the ten participants, five had come across a PWC; however, only two had dealt with PWC assessment and one participant carried out treatment. In their retest scores, three had less than 15 out of 25. This observation also brings to notice, the less number of cases available, and that knowledge gained in theory classes can still be limiting.

**2. Comparison of pretest and posttest questionnaire scores within prospective SLPs**

In prospective SLPs, the range of pretest score was 3 with a minimum score of 12 and a maximum score of 15. Three of them scored 12 in 25, one scored 14 and one scored 15. The pretest scores indicated they had some limited knowledge about cluttering learnt in their current course. After viewing the tutorial, the posttest scores improved with minimum score being 21 and maximum score 24. The range was 3. One student scored 21, one scored 22, two got 23 score and one received 24 score. The improvement in scores indicates that their knowledge has improved and they attempted to answer the entire questionnaire. Among the B.ASLP students, one scored 15 in pretest, other three B.ASLP students and two M.Sc SLP students scored less than 15. In posttest all the five students showed improvement. However,

an indication of whether a postgraduate student has a difference in knowledge compared to undergraduate student, cannot be made as the sample size is small.

**Table 4.4**

*Comparison of pretest and posttest questionnaire scores within prospective SLPs*

	<b>Pre – Posttest Score</b>
Z	2.03
Asymp. Sig. (2-tailed)	.042*

*Note.* \* = **Significant difference at 0.01 level**

Wilcoxon Signed Ranks test was carried out to compare pretest and posttest questionnaire scores in prospective SLPs. The result indicated a significant difference between the pretest and posttest questionnaire scores within prospective SLPs ( $|Z| = 2.03, p < 0.01$ ). The results depict that the developed tutorial was useful for the prospective SLPs. It enhanced their learning and improved their knowledge on cluttering.

### **3. Comparison of pretest and posttest questionnaire scores within experienced SLPs**

In experienced SLPs, the range of pretest score was 8 with a minimum score of 11 and a maximum score of 19. Among them, two scored less than 15. The pretest scores obtained by them indicated they had some knowledge about cluttering learnt during their student years. After viewing the tutorial, the post-test scores improved with minimum score being 20 and maximum score 25. The range was 5. Two participants scored 25 in the posttest. The improvement in scores

indicates that their knowledge has improved and they attempted to answer the entire questionnaire.

**Table 4.5**

*Comparison of pretest and posttest questionnaire scores within experienced SLPs*

	<b>Pre - Posttest Score</b>
Z	2.03
Asymp. Sig. (2-tailed)	.042*

*Note.* \* = **Significant difference at 0.01 level**

Wilcoxon Signed Ranks test was carried out to compare pretest and posttest questionnaire scores in experienced SLPs. The result indicated significant difference between the pretest and posttest questionnaire scores within prospective SLPs ( $|Z| = 2.03, p < 0.01$ ). The results depict that the developed tutorial was helpful for the experiences SLPs. It enhanced their learning and improved their knowledge on cluttering.

**4. Comparison of pretest and posttest questionnaire scores between prospective and experienced SLPs**

**Table 4.6**

*Comparison of pretest and posttest questionnaire scores between prospective and experienced SLPs*

	<b>Pretest Score</b>	<b>Post Score</b>
Z	1.06	0.10
Asymp. Sig. (2-tailed)	.289	.916

Mann Whitney Test was carried out to carry out for statistical analysis of the pretest and posttest questionnaire scores between the two groups. The results revealed no significant difference in pretest scores between the two groups ( $|Z| = 1.06, p > 0.01$ ). This indicates that the knowledge on cluttering is limited in both groups and does not increase much, despite gaining experience in the field. One of the reasons that can be suggested is that, cluttering is heterogeneous and rarely occurs as a pure disorder. Hence despite the limited knowledge gained during cluttering, there can be issues while assessing, diagnosing and treating PWC due to the lack of clinical exposure among speech-language pathologists (Blanchet et al., 2015).

The statistical analysis of the posttest scores between the two groups was also carried out. The results revealed that there was no significant difference in pretest scores between the two groups ( $|Z| = 0.10, p > 0.01$ ). It is evident that the tutorial can be used by both prospective and experienced SLP to gain more knowledge on cluttering. This will further enable them to carry out assessment and treatment of PWC with less issues.

Similar studies have also been carried out in the area of voice, autism spectrum disorders and pre reading skills. Results revealed that these video tutorials will help SLPs to obtain thorough knowledge of the different aspects for efficient clinical application.

### ***5. Comparison of pretest and posttest questionnaire response for each question***

For questions no. 1, 2, 7, 9, 11, 12, 15, 17, 21, 22, 23 and 25 all ten participants were able to provide correct response in the posttest. The five prospective SLPs were also able to answer question no 2, 8, 10, 13, 14, 19, 20 and 24 correctly and the five experienced SLPs scored full for question no. 4, 5, 6 and 15. Out of these questions there was a significant improvement observed for question no 12, 17, 21 and 23 with less than five of the total participants scoring correctly in pretest and all ten participants scoring correctly in posttest.

Other questions in which there was a good improvement from pretest to posttest scores among the prospective SLPs included question number 4, 15, 16, 18 and question no. 3, 10, 14, 19 in which only one or none of the five participants scored for pretest but four of the five were able to answer correctly after viewing the tutorial

From the posttest scores it was observed that only one prospective SLPs was able to answer question no 3 correctly, which was related to the definition of cluttering. In case of experienced SLP, only two out of the five participants were able to answer correctly the question no 20, which was related to measures of rate of speech.

To conclude, the final audio-video tutorial consisted of different aspects of cluttering that would enhance knowledge and improve clinical understanding of cluttering. The tutorial received rating from “excellent” to “good” in most of the parameters from the three professionals. Therefore, they were of the opinion that this tutorial contained relevant

information on cluttering and can be used effectively for training purposes for prospective and experienced SLPs. The quantitative analysis carried out to study efficacy of the tutorial revealed significant difference in posttest performance within prospective and within experienced SLPs.

## **CHAPTER V**

### **SUMMARY AND DISCUSSION**

Documentary films and audio-video tutorial play several roles, especially in educating general public and professionals. Cluttering is a relatively less frequently occurring speech disorder, heterogeneous in nature and often co-occurring with other conditions. Identifying, assessing and treating persons with cluttering (PWC) can become a challenge for clinicians due to the limited clinical exposure despite gaining theoretical knowledge during the speech-language pathology course.

Thus the present study was aimed to develop and validate an audio-video tutorial on cluttering for speech-language pathologists (SLPs), to improve their knowledge and understanding of the disorder.

The current study was carried out in two phases. The first phase was the development of the tutorial which included preparation of script board, video recording, preparation of pre-final video, evaluation of pre-final video by experienced SLPs and preparation of the final video. The feedback and remarks suggested by the three experienced SLPs were incorporated for the final video. The final video included themes such as etiology, general characteristics, assessment, differential diagnosis and management. Subtitles and important keywords were also added. The second phase was the field testing of the developed tutorial which included development of the tutorial, selection of participants, procedure and evaluation of results. The participants were divided into two groups with five prospective SLPs and five experienced SLPs. They were asked to fill a pretest questionnaire (before viewing of the tutorial) and a posttest questionnaire



(after viewing the tutorial). The questionnaire consisted of 25 MCQs with questions on definition, general characteristics, assessment and treatment. Correct response was scored as 1.

Data was tabulated and analyzed statistical using SPSS Version 25. Since the sample size collected was small, test of normality was not carried out and non-parametric tests were incorporated. Wilcoxon Signed Ranks test was used to compare pre and post questionnaire scores within each group. Mann-Whitney test was carried out to compare the scores between the two groups.

The finding of the study indicated that there was an overall improvement in posttest scores when compared to pretest scores and this showed a significance difference. This trend was observed within the prospective and within the experienced SLP groups. However, there was no significant difference noted in the pretest and posttest performance between the two groups. The results depict that the developed tutorial was useful for the SLPs. It enhanced their learning and improved their knowledge on cluttering gained during theory class. It was also observed there was a good improvement in response to questions 4, 3, 10, 14, 15, 16, 18 and 19 from pretest to posttest performance.

In conclusion, results of the present study indicated a significant improvement in the SLPs performance after the viewing of audio-video tutorial on cluttering. It shows that the tutorial is beneficial in facilitating better understanding of concepts for the SLPs.

*Implication:*

- The tutorial could help to improve clinical understanding of cluttering among speech language pathologists.

- It would provide relevant clinical samples or case histories of PWC, providing a correlation with theory and practical knowledge
- It would aid in early identification of the disorder
- Speech language pathologists would be able to differentially diagnose between cluttering and stuttering
- With the help of this knowledge speech-language pathologists would be able to handle PWC confidently

*Future directions*

- The study can include large sample size to demonstrate any significant difference between the two groups
- The years of experience required by professional SLP can be more to assess if there is any significant effect of experience on knowledge.
- A longitudinal study can be considered after a month or six months to study increase in knowledge on cluttering
- The tutorial can include samples for assessment purposes to further improve understanding

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**APPENDIX I**

**Script board for the Clinical Tutorial on Cluttering for Speech-Language Pathologists**

	<b>Visual</b>	<b>Audio</b>
1	<p><i>Opening</i></p> <p>Logo of AIISH followed by</p> <p>Dissertation title- Clinical Tutorial on Cluttering for Speech-Language Pathologists</p> <p>Student name- Ms. Joel Joseph</p> <p>Student registration number- 19SLP013</p> <p>Guide's name- Dr. Sangeetha Mahesh</p> <p>Guide's designation- Associate Professor and Head, Department of Clinical Services</p> <p>All India Institute of Speech and Hearing</p>	<p>Clinical Tutorial on Cluttering for Speech-Language Pathologists</p> <p>This tutorial is developed as part of Masters dissertation under the guidance of Dr. Sangeetha Mahesh, Clinical reader and Head, Department of Clinical Services, All India Institute of Speech and Hearing</p>

2	<p><i>Introduction</i></p> <p>Visual of speaker speaking</p>	<p>Fluency of speech involves a smooth flow of information and speech. Often slight breakdowns in this flow go unnoticed; even a well-articulated orator can fumble up. Disorders of fluency include developmental stuttering, acquired stuttering, and cluttering. (Ward, 2006).</p> <p>In recent years, there is an increase in awareness about cluttering among the general population and speech-language pathologists. However, there is a low prevalence of cluttering compared to stuttering, primarily due to the limited prevalence of cluttering and coexisting with other disorders.</p> <p>Therefore, identifying, assessing and treating persons with cluttering (PWC) can become a challenge for clinicians despite gaining theoretical knowledge during the speech-language pathology course.</p>
3	<p><i>Objective</i></p> <p>Text slide</p>	<ol style="list-style-type: none"> <li>7. To develop a clinical tutorial on cluttering for speech-language pathologists.</li> <li>8. To validate the content of the tutorial</li> <li>9. To compare the knowledge on cluttering between prospective SLPs and experienced speech-language pathologists.</li> </ol>
4	<p><i>Cluttering</i></p> <p>Visual of speaker speaking</p> <p>Picture slide</p>	<p>Since cluttering is heterogeneous and rarely occurs as a pure disorder, there has always been a universal disagreement in defining cluttering. Initial definitions included defining the disorder as a problem in word-finding, a form of motor integration disturbance, central language imbalance, etc.,</p> <p>The standard cluttering characteristics considered by clinicians and researchers are best considered in the 'Lowest common denominator' definition given by St. Louis and Schulte (2011)</p>

	Text slide	<p>According to them,</p> <p>"Cluttering is a fluency disorder wherein segments of conversations in the speaker's native language typically are perceived as too fast, too irregular, or both. The segments of rapid and/or irregular speech rate must further be accompanied by one or more of the following: (a) excessive 'normal' disfluencies; (b) excessive collapsing or deletion of syllables; (c) and/or abnormal pauses, syllable stress, or speech rhythm."</p>
5	<p><i>Etiologies</i></p> <p>Text slides</p> <p>Picture slides</p>	<p>As in the case of stuttering, there is no specific cause for cluttering. Some researchers consider a genetic component for cluttering, with the disorder running in families. Few theorize a neurological origin with atypical brain structure or function. In an imaging study conducted by Ward et al. in 2015, there was some evidence of overactivation of the premotor cortex and basal ganglia in AWC. Thus it remains still unclear what is the exact cause</p>
6	<p><i>Informal Assessment</i></p> <p>Visual of speaker speaking</p> <p>Text slides</p> <p>Picture slides</p>	<p>Cluttering is a multifaceted disorder in which multiple domains are affected, involving the linguistic and/or motoric components. Hence, it is important to carry out a detailed case history initially.</p> <p>Case history information can be collected from the client as well as his/her communication partners. Some of the important aspects that need to be covered include</p> <ul style="list-style-type: none"> <li>• The present complaints of the client, the duration, it's nature and onset</li> <li>• Relevant family history, whether any family member clutter or have any other communication problem</li> <li>• Any earlier investigations, diagnosis and treatment done</li> <li>• The client's, his family members and other communication partner's perception of the speech problem</li> <li>• When and who noticed the speech defects initially</li> </ul>



		<ul style="list-style-type: none"> <li>• Whether the client is aware of the problem himself/herself</li> <li>• Whether the client has any variation in speech defects in any particular situation or with any particular individual</li> <li>• Whether the client has difficulty in specific sounds or words, in specific positions</li> <li>• Any difficulty in attending to a particular task</li> <li>• Examination of speech mechanism</li> <li>• Presence of any other problems that accompany cluttering, such as central auditory processing deficits, reading problems, etc</li> <li>• The clinician should observe for prominent aspects of cluttering such as rate, fluency, articulation, etc</li> </ul>
7	Visual of speaker speaking	Let's now listen to some examples of these symptoms and understand how to assess them
8	<i>Rate</i> Visual of speaker speaking	<p>One of the common symptoms associated with cluttering is tachylalia, a rapid or irregular rate. Festination is quite common, too, in which the person speaks progressively faster and faster, leading to an indistinct murmur.</p> <p>However, tachylalia alone does not indicate cluttering, as there are cases where it does not seem to be a rapid rate overall, just spurts of rapid speech resulting in an irregular rate of speech</p>
9	<i>Rate</i> Visual of speaker speaking	<p>There are two measures of rate commonly used to assess articulatory rate:</p> <p>(A) Overall speaking rate (in syllables per minute) (B) Mean articulatory rate (in syllables per second)</p>
10	<i>Rate - Overall speaking rate</i>	In overall speaking rate, the entire duration of speech including disfluencies (pauses, prolongation and other interruptions) will be considered to measure. The number of

	<p>Text slide</p> <p>YouTube video</p> <p>Audio of PWC speech</p>	<p>syllables or words produced is calculated and divided by the duration (in minutes). The iterations should be removed, as they can affect the counting of linguistic units</p> <p>The usual rate of speech for adult speakers is an average of 6-7 syllables per second or 80-180 words per minute. Rate varies based on factors such as language and age. Hence they should be considered during the evaluation</p>
11	<p><i>Rate - Mean articulatory rate</i></p> <p>Visual of speaker speaking</p> <p>Text slide</p> <p>Audio of PWC speech</p>	<p>However, as most PWC do not speak at a consistently rapid rate but with sudden bursts of fast rate and inappropriate pauses during speech, the rate of speech when measured using syllables per minute would appear slower than perceived.</p> <p>Therefore using the mean articulatory rate would be more suitable to capture the sudden increase in rate.</p> <p>Mean articulatory rate can be determined by selecting five at random measures (with at least ten consecutive fluent syllables) within the sample, calculating the number of fluent syllables divided by the duration (in seconds) of the utterance. Pauses longer than 250 ms, utterances with stuttering-like disfluencies and other disfluencies should be removed</p> <p>Greater than five syllables per second can be considered to be a fast articulatory rate</p>
12	<p><i>Rate</i></p> <p>Visual of speaker speaking</p>	<p>One crucial point to keep in mind while assessing rate is that the perception of fast rate can be due to co-articulation, normal disfluencies, etc., and while measuring in syllables per second, it may not exceed the normative rate. Hence Mean articulatory rate should be calculated for assessment of rate</p>
13	<p><i>Articulation</i></p> <p>Visual of speaker speaking</p>	<p>Due to their rapid rate PWC struggle to maintain the articulatory accuracy required for precise speech production. They may show distortion, cluster reductions, weak syllable deletions, etc., that make their speech seem dysarthric</p>

	Visual of PWC speech	<p>Telescoping or condensing of multisyllabic words is a common observation made in their speech. For example, "intelligibility" as "integibility."</p> <p>Because the articulatory errors observed in PWC are not phoneme specific and are inconsistent, speech intelligibility is further affected</p> <p>Assessment can include an oral examination, automatic speech and increasingly complex utterances to assess articulatory errors</p>
14	<p><i>Fluency</i></p> <p>Visual of speaker speaking</p> <p>Text slides</p> <p>Picture slides</p>	<p>Moving on to disfluencies, there basically two types: normal disfluencies such as interjections, revisions, word repetitions, and stuttering like disfluencies such as the core behaviors: repetition, blocks and prolongations.</p> <p>In PWC, the normal disfluencies, frequently interjections and revisions, occur more than the stuttering-like disfluencies. Authors suggest these normal disfluencies tend to occur more as PWC does not get sufficient time to organize and formulate utterances because of their rapid rate</p>
15	<p><i>Fluency</i></p> <p>Text slide</p> <p>Visual of speaker speaking</p> <p>Visual of PWC speech</p>	<p>The ratio of disfluencies by dividing the number of normal disfluencies to the number of stuttering-like disfluencies can be taken for assessment. A value of 1.7 or higher is an indication of possible cluttering.</p> <p>In cases of stuttering like disfluencies occurring in cluttering stuttering cases, all of the fluency errors would be produced with less or no awareness and absent secondary behaviors</p>
16	<p><i>Speech rhythm</i></p> <p>Visual of speaker speaking</p> <p>Text slide</p>	<p>The lack of or inappropriate rhythm is another feature noted in cluttering. The jerky bursts of rapid speech and inappropriate pauses, in turn, leads to a staccato impression of speech, choppy and disrupted.</p>

	<p>Audio of PWC speech</p>	<p>For example, this sentence "Leaves...fall during...the beautiful..... season...of autumn. "</p> <p>Researchers mention that in some PWC, the pause required for breath taking and language formulation is at times shorter and fewer. Thus speech can sometimes sound rushed</p>
17	<p><i>Language</i></p> <p>Visual of speaker speaking</p> <p>Text slides</p> <p>Picture slides</p> <p>Audio of PWC speech</p>	<p>Cluttering can affect both the speech and language skills of an individual. One of the experts in cluttering, Weiss, in 1964, also described the disorder as a 'Central language imbalance.'</p> <p>PWC can have difficulty in planning and organizing what they want to say, sounding lost. Researchers describe this behavior as 'linguistic maze behavior.' These behaviors include word-finding problems, impaired syntactic structure, issues in coherence and cohesion and impaired pragmatic abilities. They disrupt the conversation, making the PWC seem lost and unable to convey their intended message.</p> <p>Some of the PWC attempt to recover their original message and produce excessive disfluencies such as revisions and false starts. The more the linguistic burden, the more mazes are observed in speech</p>
18	<p><i>Language</i></p> <p>Visual of speaker speaking</p> <p>Picture slides</p>	<p>Another common language problem observed in PWC is an inappropriate response to listener cues, leading to communication failures. They lack appropriate turn-taking skills and can seem unaware of listener signals that indicate their speech is not understood. Tasks to assess the language abilities should include retelling a story, narration and conversation</p>
19	<p><i>Writing</i></p> <p>Visual of speaker speaking</p> <p>Picture of PWC written sample</p>	<p>Errors in writing often mimic speech difficulties. The PWC can have untidy and illegible handwriting, poorly constructed grammar, weak spelling.</p> <p>For assessment, the PWC should write a short paragraph.</p>

20	<p><i>Awareness and speech monitoring</i></p> <p>Visual of speaker speaking</p> <p>Visual of PWC speech</p>	<p>PWC are often unaware of their speech problems and therefore do not experience any anxieties while speaking. However, authors report that PWC's speech is much better in a formal and controlled situation such as when aware of being recorded, reading an unknown text, speaking a foreign language as these situations demand higher focus, and PWC tends to pay attention to what they speak. Hence, for assessment, speech in an uncontrolled and natural situation should be considered</p>
21	<p><i>Other characteristics</i></p> <p>Visual of speaker speaking</p>	<p>PWC can be forgetful, easily distracted and have a short attention span. They can show a general lack of organizational and coordination skills. They can also exhibit auditory processing problems</p>
22	<p><i>Coexisting conditions</i></p> <p>Visual of speaker speaking</p> <p>Text slides</p> <p>Picture slides</p> <p>YouTube video</p>	<p>Prevalence of a 'pure cluttering disorder' is low and often occurs with coexisting conditions, attributing to complicating factors in identifying and treating. One of the most common coexisting disorders is stuttering. Other disorders include articulation disorders with specific articulatory errors, Down syndrome, Fragile X syndrome, Attention-deficit/ hyperactivity disorder, (central) auditory processing disorders, and apraxia.</p>
23	<p><i>Questions</i></p> <p>Visual of speaker speaking</p> <p>Picture slide</p>	<p>Before moving further to assessment tools and treatment, here are some questions to assess your understanding of cluttering and its characteristics.</p>
24	<p><i>Questions</i></p>	<p>NO AUDIO</p>

	Text slide	<ol style="list-style-type: none"> <li>1. There has always been a universal disagreement in defining cluttering due to the fact it is _____ and _____.</li> <li>2. Two measures of rate commonly used to assess rate of speech are _____ and _____.</li> <li>3. Greater than _____ can be considered to be a fast articulatory rate</li> <li>4. In PWC, the _____, occur more than the _____ disfluencies</li> <li>5. _____ include word-finding problems, impaired syntactic structure, issues in coherence and cohesion and impaired pragmatic abilities</li> </ol>
25	<p><i>Answers</i></p> <p>Text slide</p>	<p>NO AUDIO</p> <ol style="list-style-type: none"> <li>1. There has always been a universal disagreement in defining cluttering due to the fact it is <b>heterogeneous and rarely occurs as a pure disorder</b>,</li> <li>2. Two measures of rate commonly used to assess articulatory rate are <b>overall speaking rate and mean articulatory rate</b></li> <li>3. Greater than <b>five syllables per second</b> can be considered to be a fast articulatory rate</li> <li>4. In PWC, the <b>normal disfluencies</b> occur more than the <b>stuttering-like disfluencies</b></li> <li>5. <b>Linguistic maze behavior</b> include word-finding problems, impaired syntactic structure, issues in coherence and cohesion and impaired pragmatic abilities</li> </ol>
26	<p><i>Assessment checklists and inventories for cluttering</i></p> <p>Visual of speaker speaking</p>	<p>Various checklists and inventories available aid in assessing and profiling the characteristics of PWC across multiple domains. Let us now look into some of the commonly used tools</p>

27	<p><i>Predictive Cluttering Inventory-Revised</i></p> <p>Visual of speaker speaking</p> <p>Text slide</p> <p>Picture slides</p>	<p>Van Zaalen et al. in 2009, revised the original Predictive cluttering inventory (Daly’s checklist) to differentially diagnose possible cluttering. They divided 33 symptoms into four sections; speech motor, language planning, attentiveness and motor and planning. They used a 0 (never) -5 (always) rating scale to score each symptom</p> <p>According to PCI- R,</p> <ul style="list-style-type: none"> <li>• Possible cluttering diagnosis requires a score of greater than 24 in section 1 (speech motor)</li> <li>• Section 2 provides information on the linguistic component</li> <li>• Section 3 and 4 provide information on personal communicative skills</li> </ul>
28	<p><i>Cluttering Severity Instrument</i></p> <p>Visual of speaker speaking</p> <p>Text slide</p> <p>Picture slides</p>	<p>The Cluttering Severity Instrument is a freeware assessment tool developed by Bakker in 2011, available in PC format. CSI allows the clinician to rate the severity across eight perceptual ratings: overall intelligibility, speech rate regularity, speech rate, articulatory precision, typical disfluency, language disorganization, discourse management, use of prosody; and % sample duration cluttered.</p> <p>Bakker believes that cluttering is to be assessed as a whole and not just dissected into individual dimensions such as rate, fluency et.. Therefore after completing the nine dimensions, results reveal the percentage of cluttered speech, overall weighted CSI score and a graph showing the individual results obtained (range and point estimate). The graph allows the clinician to compare the baseline to post-therapy, make treatment plans.</p>
29	<p><i>Stuttering Severity Index</i></p> <p>Visual of speaker speaking</p> <p>Text slide</p>	<p>As mentioned earlier, cluttering often coexist with stuttering; hence an assessment of the disfluent behaviors should be carried out using the Stuttering severity instrument – 4. It measures the frequency of disfluencies, duration of stuttering events, physical concomitants and naturalness of speech. It helps to assess the severity of stuttering.</p>

	Picture slides	
30	<i>Self-awareness of speech index</i> Visual of speaker speaking Picture slide	The self-awareness of speech index rating scale developed by St. Louise and Atkins, 2005) assesses self-awareness in PWC. It consists of 14 questions assessing awareness of different speech problems such as how fast they speak, how fast others speak, etc.,
31	Visual of speaker speaking Picture slide	In addition to these tools, routine hearing test and central auditory processing test using Screening Checklist for Auditory Processing and those identified at-risk of APD will undergo detailed assessment.
32	<i>Differential Diagnosis</i> Visual of speaker speaking Text slide YouTube video	As we know by now, cluttering is a separate fluency disorder from stuttering; hence it is also essential to be aware of the differences between the two fluency disorders. The given table lists the differences and similarities between cluttering and stuttering, which would help you differentially diagnose the two conditions.
33	<i>Treatment</i> Visual of speaker speaking	The assessment carried out helps to identify particular challenges in each client. A synergistic approach involving improvement in fluency, rate, rhythm, articulation, language and self-monitoring is most suitable for treatment, as improvement in one aspect inevitably improves others
34	<i>To improve the client's awareness of disfluencies</i> Visual of speaker speaking Text slide	As cluttering is a multifaceted disorder, it is essential for an individualized treatment plan for each client. However, the goal should start from self-awareness.  The PWC should identify their symptoms initially, using recordings and visuals of their speech. SLP can record their speech and the speech of PWC, later asking the client to identify the variations/differences. The PWC can be asked to



		<p>rate both the speech samples and point out the symptoms such as fast rate, etc.</p> <p>The PWC can also be asked to maintain a note indicating when their communication partner does not understand them. This will increase their awareness of their speech difficulties and motivate them to speak better.</p>
35	<p><i>To reduce the rate of speech</i></p> <p>Visual of speaker speaking</p> <p>Text slide</p> <p>Demonstration video</p> <p>Picture slides</p> <p>YouTube video</p>	<p>Ask the PWC to move his arm at different rates and then speak at the matching rate. This activity will provide them with sensory feedback. Slowly alternate and remove the feedback. Slow and fast-paced music and beats using metronome can also be used.</p> <p>Duration of a prerecorded sentence can be given, and PWC should be asked to match the rate with that given using stopwatch</p> <p>In the case of children, the use of speeding tickets, speedometer, red or yellow lights helps to reduce the rate.</p> <p>A device that can also be utilized to reduce rate is Delayed Auditory Feedback (DAF). DAF electronically alternates the speech signal in such a way the delay in feedback helps to reduce rate in the speaker.</p>
36	<p><i>To work on the rhythm of speech</i></p> <p>Visual of speaker speaking</p> <p>Text slide</p> <p>Demonstration videos</p> <p>Picture slides</p>	<p>The SLP can provide visual cues to improve rhythm. Using a highlighter, the clinician should mark the appropriate places to pause or break the sentences and where to apply the stress. Encourage the PWC to read poetry as it allows the PWC to use rhythmic speech and appropriate pauses. They should be encouraged to read out the poem independently and determine the most appropriate place to pause and provide stress.</p> <p>Feedback can also be provided using PRAAT software to teach where to place stress and how the placement can affect the sentence's meaning.</p> <p>'Are you telling me or asking me ?' is a game that can be introduced, wherein PWC should identify in which appropriate category the sentence should go.</p>

37	<p><i>To work on articulation</i></p> <p>Visual of speaker speaking</p> <p>Text slide</p> <p>Picture slides</p>	<p>The PWC can be encouraged to exaggerate multisyllabic words to include all stressed and unstressed syllables, for example, "con-di-tion-al." This adds duration, increases the loudness and pitch of each syllable.</p> <p>In the case of children, syllable puzzles can be used. These can help increase syllable awareness. In this game, the CWC will be asked to cut the picture into the number of syllables in the target word and then put the picture back together, exaggerating each syllable a little</p> <p>Oral motor drills with syllables produced in a string of 10 repetitions can help improve speech precision</p>
38	<p><i>To improve language abilities</i></p> <p>Visual of speaker speaking</p> <p>Text slide</p>	<p>To make the PWC aware of the linguistic mazes, start with recording a story generated by the PWC. The clinician then transcribes the speech and highlights the intended message. This provides the PWC a visual representation of how often discourse is disrupted.</p> <p>Ask the PWC to write down the story in chunks on cards, sequence them and repeat the story again. Use role-play activities, follow a script and use turn-taking during the conversation</p> <p>Another way to improve narrative and sequencing of information is using Ward's pyramid model of narrative structure to improve the length and complexity of utterance. The pyramid starts from concise utterances, containing crucial information only in short and direct statements. As layers go down, there is a stepwise increase in length and syntactic structure, with more minor details added. Through this approach, the sequencing of verbal information can also be worked on.</p> <p>The conversation between the client and clinician can be recorded and played back to the PWC to improve the ability of PWC to notice and respond to the listener's cues for information. The cues, like the confused look, will then be pointed out to PWC and will be encouraged to respond appropriately, like "Did you understand?" to make the</p>

		listener comprehend the intended message better and complete
39	<p><i>To reduce speech disfluencies (especially in the case of cluttering-stuttering individuals)</i></p> <p>Visual of speaker speaking</p>	Fluency shaping and stuttering modification approaches can be taken up for intervention in case of cluttering-stuttering
40	<p><i>To work on self-monitoring</i></p> <p>Visual of speaker speaking</p> <p>Text slide</p>	Self-monitoring develops after much practice. The PWC should record their conversation and rate their speech with their communication partners. They can maintain a daily record of situations where an intended message was not delivered
41	<p><i>Questions</i></p> <p>Visual of speaker speaking</p> <p>Picture slide</p>	As we have reached the end of this tutorial, here are some questions to assess your understanding.
42	<p><i>Questions</i></p> <p>Text slide</p>	<p>NO AUDIO</p> <ol style="list-style-type: none"> <li>1. According to PCI- R, a possible cluttering diagnosis requires a score of _____ in section 1 (speech motor) and section 2 provides information on the _____.</li> <li>2. The _____ a freeware assessment tool developed by Bakker in 2011, available in PC format</li> <li>3. Ward's pyramid model of narrative structure starts from concise utterances containing _____.</li> <li>4. _____ and _____ can be taken up for intervention in case of cluttering-stuttering</li> </ol>

		5. Mention any three differences between stuttering and cluttering
43	<i>Answers</i>  Text slide	NO AUDIO  <ol style="list-style-type: none"> <li>1. According to PCI- R, a possible cluttering diagnosis requires a score of <b>greater than 24</b> in section 1 (speech motor), and section 2 provides information on the <b>linguistic component</b></li> <li>2. The <b>Cluttering Severity Instrument</b> a freeware assessment tool developed by Bakker in 2011, available in PC format</li> <li>3. Ward's pyramid model of narrative structure starts from concise utterances containing <b>crucial information</b>.</li> <li>4. <b>Fluency shaping and stuttering modification approaches</b> can be taken up for intervention in case of cluttering-stuttering</li> </ol>
44	<i>Conclusion</i>  Visual of speaker speaking	To conclude cluttering is a multifaceted disorder with probable genetic and neurological etiology. Multiple domains, involving the linguistic and/or motoric components are affected. However due to it's low prevalence and heterogeneous nature, cluttering is a challenging condition  This tutorial was developed to elaborate on how to identify the features of cluttering; how to assess with regard to the rate, articulation, fluency and language, how to treat PWC. This tutorial can therefore serve as a reference for speech-language pathologists to handle PWC with more confidence.
45	<i>References</i>  Scrolling text	NO AUDIO
46	<i>Thank you</i>  Text slide	NO AUDIO

## APPENDIX II

### Validation Questionnaire

Adapted from Feedback Rating Questionnaire in Field Testing of MANAT-K

(Goswami, S. P., Shanbal, J. C., Samasthitha, S., & Navitha, U. 2010)

Sl. No	Parameters	Very Poor	Poor	Fair	Good	Excellent
1	Simplicity (Is the tutorial comprehensible?)					
2	Size (Are the pictures, slides and subtitles of appropriate size?)					
3	Color and appearance (Are the videos in the tutorial appropriate in terms of color and dimension?)					
4	Presentation (Are the subtitles and slides placed in the video appropriately?)					
5	Volume (Is the volume in the tutorial adequate?)					
6	Relevance (Is the tutorial culturally and ethically acceptable?)					
7	Iconicity (Does the picture and video appeared to be recognizable and representational?)					
8	Accessibility (Is the tutorial user friendly?)					

9	Trainability (Can the tutorial be used for student training purpose?)					
10	Publication, outcomes and developers (Is there any other resource material similar to this video tutorial which you are aware of?)					
11	Questionnaire (Are the test items used in the questionnaire appropriate?)					
12	Coverage of parameters (Does the tutorial contain essential information on the fluency disorder?)					
Any Comments:						

**APPENDIX III**  
**CLINICAL TUTORIAL ON CLUTTERING FOR SPEECH-LANGUAGE**  
**PATHOLOGISTS**  
**– Master's Dissertation (Speech-Language Pathology) 2020 - 2021**

***PRETEST POSTTEST***  
***QUESTIONNAIRE***

**PART 1**

<i>Name:</i>	<i>Student: Yes/No</i>
<i>Age:</i>	<i>If yes, course and year:</i>
<i>Gender:</i>	<i>Working: Yes/No</i>
	<i>If yes, years of experience in the field:</i>

1. *Have you come across any persons with cluttering (PWC): Yes/No*  
If yes,
2. *Have you ever carried out assessment for a PWC: Yes/No*
3. *Have you ever delivered treatment for a PWC: Yes/No*

**PART 2**

1. The most researched and reported symptom of cluttering is
  - (a) Irregular rhythm
  - (b) Rapid rate
  - (c) Over coarticulation
  - (d) None of the above

2. Which among the following are the major component(s) in cluttering
  - (a) Motoric
  - (b) Linguistic
  - (c) Neurogenic
  - (d) (a) and (b)
  
3. According to the lowest common denominator definition of cluttering, which of the following symptoms can accompany fast or irregular rate of speech, to identify cluttering
  - (a) Poor self-monitoring skills, lack of awareness
  - (b) Word-finding problems, impaired syntactic structure, issues in coherence and cohesion
  - (c) Motor coordination and writing problems
  - (d) Excessive normal disfluencies, over coarticulation, abnormal pause and rhythm
  
4. The term 'festinating' speech refers to
  - (a) Irregular rate of speech
  - (b) Progressively increasing speech rate
  - (c) Progressively decreasing speech rate
  - (d) Presence of telescopic words in speech
  
5. Another common term used interchangeably with cluttering is
  - (a) *Laconic*
  - (b) *Tachypnea*
  - (c) *Tachyphemia*
  - (d) *Aphemia*



6. An example of telescoping in target word “conversation” is
  - (a) Part word repetition of target word
  - (b) Conservation
  - (c) Consation
  - (d) Conservatition
  
7. Research suggests etiology of cluttering to have only genetic origin
  - (a) True
  - (b) False
  
8. Which among the following statements is not true
  - (a) Cluttering does not involve a single characteristic, rather has a cluster of diagnostic criteria
  - (b) Presence of secondary behavior are atypical
  - (c) Cluttering is homogenous and rarely coexist with other disorders
  - (d) Rapid rate alone do not indicate cluttering
  
9. The term “Maze behaviors” in PWC refers to
  - (a) Rapid rate and shifts in rhythm
  - (b) Impaired syntactic structure and pragmatic abilities
  - (c) Telescoping behaviors
  - (d) Irregular change and shifts in rhythm
  
10. Which among the following statements is false
  - (a) PWC can speak better in a formal and controlled situation like when aware of being recorded
  - (b) Errors in writing often mimic speech difficulties in PWC

- (c) Cluttering occurs commonly with other disorders such as Down Syndrome, ADHD
- (d) Prosodic deviances and articulatory errors are never observed in PWC

11. Which among the following statements is not true

- (a) PWC can have untidy illegible handwriting
- (b) PWC can show inappropriate response to listener cues
- (c) Linguistic maze behavior add more information and help PWC to be clear with what they want to say
- (d) PWC can have distortion, cluster reductions, weak syllable deletions, etc., that make their speech seem dysarthric

12. The assessment tools used for cluttering can include

- (a) PCI- R
- (b) CSI
- (c) SSI
- (d) All of the above

13. Another name for Daly's checklist is

- (a) Prognostic Cluttering Instrument
- (b) Predictive Cluttering Instrument
- (c) Predictive Cluttering Inventory
- (d) Prognostic Cluttering Inventory

14. According to the PCI- R

- (a) Greater than 120 indicates cluttering
- (b) Between 80 to 120 indicates cluttering - stuttering
- (c) Greater than 24 in Section 1 indicates possible cluttering
- (d) (a) and (b)

15. PCI-R does not consist of one of the following sections
- (a) Speech motor
  - (b) Language planning
  - (c) Attentiveness
  - (d) Neurological signs
16. Which among the below tests can be used to assess self-awareness
- (a) CLASP
  - (b) SASI
  - (c) SCAP
  - (d) CSI
17. The \_\_\_\_\_ a freeware assessment tool for cluttering developed by Bakker in 2011, available in PC format
- (a) BCL
  - (b) SCAP
  - (c) CSI
  - (d) PCI-R
18. The ratio of nonstuttering like disfluencies to stuttering like disfluencies in PWC will be
- (a) Less than 1.7
  - (b) 1.7 or greater
  - (c) 1
  - (d) 0
19. Assessment of speech rate in PWC can be best rated using
- (a) Syllables per second
  - (b) Syllables per minute

- (c) Words per second
- (d) Words per minute

20. Which among the below statements are true

- (a) In overall speaking rate, the entire duration of speech including disfluencies (pauses, prolongation and other interruptions) will be considered to measure.
- (b) In mean articulatory rate, both fluent and disfluent syllables will be considered to measure
- (c) In mean articulatory rate, only fluent syllables will be considered to measure
- (d) (a) and (c)

21. According to van Zaalen et al. (2009), fast articulatory rate is considered to be

- (a) Greater than 9 syllables per minute
- (b) Greater than 5 syllables per minute
- (c) Greater than 5 syllables per second
- (d) Greater than 9 words per minute

22. Assessment of cluttering can involve which of the following tasks

- (a) Narration and conversation
- (b) Reading sample
- (c) Written sample
- (d) All of the above

23. Most frequent type of disfluencies in PWC

- (a) Prolongation, hesitations
- (b) Interjections, revision
- (c) Syllable repetition, tense blocks
- (d) Unfinished utterance, blocks

24. Assessment of PWC will include:

- (a) Rhythm, articulation and language
- (b) Voice and articulation
- (c) Fluency and Rate
- (d) (a) and (c)

25. The treatment plan for a PWC should always start with

- (a) Improving rate
- (b) Improving fluency
- (c) Working on negative feelings and secondary behaviours
- (d) Improving self-awareness

-----*THANK YOU*-----

**Answer key**

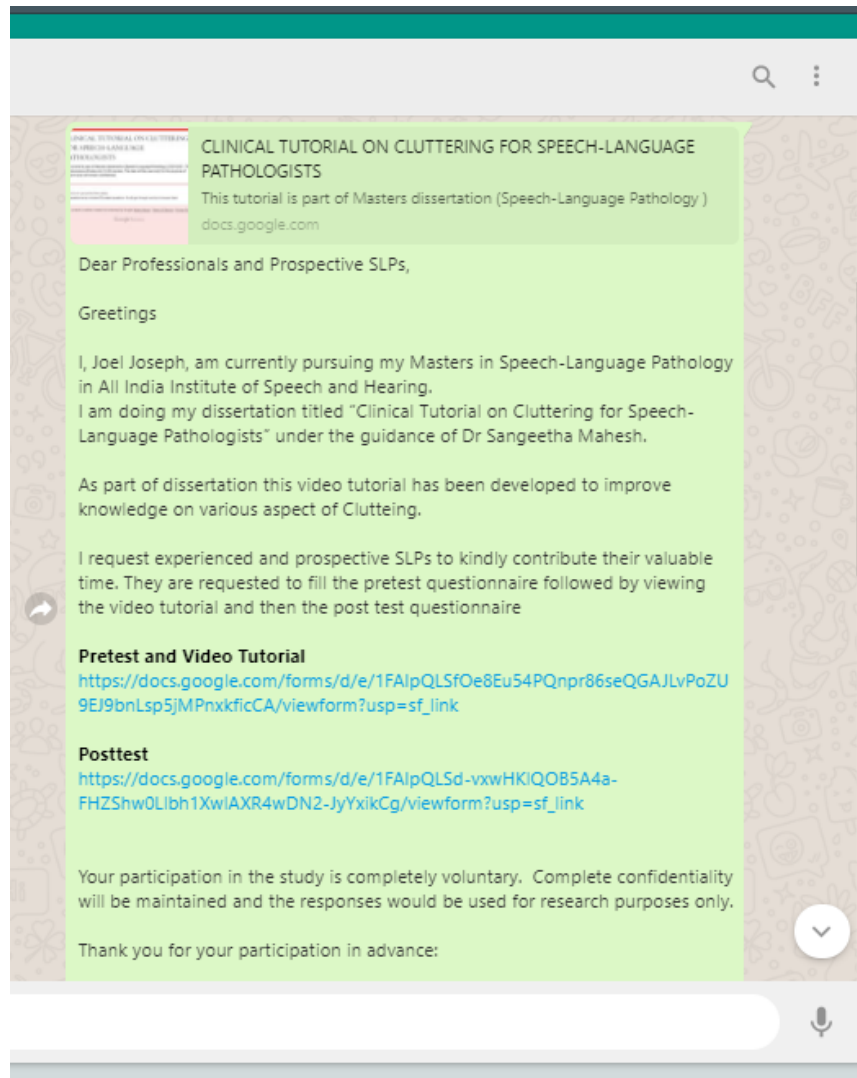
1	<b>(b)</b> Rapid rate	11	<b>(c)</b> Linguistic maze behavior add more information and help PWC to be clear with what they want to say	21	<b>(c)</b> Greater than 5 syllables per second
2	<b>(d)</b> (a) and (b)	12	<b>(d)</b> All of the above	22	<b>(d)</b> All of the above
3	<b>(d)</b> Excessive normal disfluencies, over coarticulation, abnormal pause and rhythm	13	<b>(c)</b> Predictive Cluttering Inventory	23	<b>(b)</b> Interjections, revision
4	<b>(b)</b> Progressively increasing speech rate	14	<b>(c)</b> Greater than 24 in Section 1 indicates possible cluttering	24	<b>(d)</b> (a) and (c)
5	<b>(c)</b> Tachyphemia	15	<b>(d)</b> Neurological signs	25	<b>(d)</b> Improving self-awareness
6	<b>(c)</b> Consation	16	<b>(b)</b> SASI		
7	<b>(b)</b> False	17	<b>(c)</b> CSI		
8	<b>(c)</b> Cluttering is homogenous and rarely coexist with other disorders	18	<b>(b)</b> 1.7 or greater		
9	<b>(b)</b> Impaired syntactic structure and pragmatic abilities	19	<b>(a)</b> Syllables per second		
10	<b>(a)</b> Prosodic deviances and articulatory errors are never observed in PWC	20	<b>(d)</b> (a) and (c)		

**APPENDIX IV**  
**CLINICAL TUTORIAL ON CLUTTERING FOR SPEECH-LANGUAGE**  
**PATHOLOGISTS**

– **Master's Dissertation (Speech-Language Pathology) 2020 - 2021**

***PRETEST POSTTEST***

***QUESTIONNAIRE – Google Form example***



# CLINICAL TUTORIAL ON CLUTTERING FOR SPEECH-LANGUAGE PATHOLOGISTS

This tutorial is part of Masters dissertation (Speech-Language Pathology ) 2020-2021. This questionnaire will take only 15-20 minutes. The data will be used only for the purpose of research and will remain confidential.



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## PRETEST QUESTIONNAIRE

This questionnaire includes 25 pretest questions. Kindly go through and try to answer them

# CLINICAL TUTORIAL ON CLUTTERING FOR SPEECH-LANGUAGE PATHOLOGISTS



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Saving...

\* Required

## Part 1

Name: \*

Your answer

Email id: \*

Your answer



This is a required question



## Part 2

Please read the questions carefully and select the options according to your perception and experience in the field of fluency disorders

1. The most researched and reported symptom of cluttering is

- (a) Irregular rhythm
- (b) Rapid rate
- (c) Over coarticulation
- (d) None of the above

## Video tutorial

Kindly click the link and go through the video tutorial. In case the link doesn't connect, kindly submit this form and click the link sent through WhatsApp message

[https://drive.google.com/file/d/1VV9WZqqFHS6j\\_KodHCTaz4pyZLPp-Gkb/view?usp=drive\\_web](https://drive.google.com/file/d/1VV9WZqqFHS6j_KodHCTaz4pyZLPp-Gkb/view?usp=drive_web)

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## POST TEST QUESTIONNAIRE

Thank you for watching the video tutorial. This questionnaire includes 25 posttest questions. Kindly go through and try to answer them

## Part 2

Please read the questions carefully and select the options accordingly

1. The most researched and reported symptom of cluttering is

- (a) Irregular rhythm
- (b) Rapid rate
- (c) Over coarticulation
- (d) None of the above

2. Which among the following are the major component(s) in cluttering


- (a) Motoric
- (b) Linguistic
- (c) Neurogenic

Thank you

Thank you for spending your valuable time to fill out the questionnaire and contributing for research.

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