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Historical foundations of stuttering research: A brief bibliographic review

S. Venkatesan *

Formerly Dean-Research, Professor and Head, Department of Clinical Psychology, All India Institute of Speech and Hearing, Mysore: 570006, Karnataka, India.

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Abstract

Stuttering is a distinct speech fluency disorder affecting people of all ages, from children to adults. Although recognized for centuries, the understanding of stuttering—including definitions, classifications, and the history of stuttering research in Eastern and Western contexts, as well as the influence of religion, mythology, and scriptures up to the 18th and 19th centuries. This bibliographic review seeks to highlight only few key developments and timelines in stuttering research. The review identified approximately 96 notable works, including books, chapters, and original research articles, from 511 sources collected through various online and offline databases. These contributions were systematically organized, coded, and analyzed according to themes, publication years, journal names, and publishers. The results were visualized using a harvest plot and followed PRISMA-2020 guidelines. The review concludes with a summary of insights and implications for future research directions.

Keywords: Stammering; Cluttering; Non-Fluency; Religion

1. Introduction

"Stammering" is the British term, while "stuttering" is used in the U.S., New Zealand, and Australia. Related terms include cluttering, sputtering, and gibbering. The terminology reflects cultural nuances, and using derogatory terms is discouraged as they may show disrespect towards individuals with stuttering (Shell, 2005; Ham, 1990; Bloodstein, 1960).

Stuttering and cluttering are distinct speech fluency disorders with different symptoms and causes. Stuttering primarily impacts speech fluency, whereas cluttering affects articulation, language, voice, and fluency. Individuals with cluttering may be unaware of their disorder, while those who stutter are often highly aware but struggle to articulate. Cluttering can also lead to difficulty organizing thoughts, which is less common than stuttering (Ward, 2017; Scott, 2017; St. Louis et al. 2003).

1.1. Research questions

This research focused on investigating the historical foundations of stuttering studies through a concise bibliographic review. It explored chosen key themes, including definitions, classifications, and the history of stuttering research in Eastern and Western contexts, as well as the influence of religion, mythology, and scriptures up to the 18th and 19th centuries.

* Corresponding author: S. Venkatesan ORCID: <https://orcid.org/0000-0001-9814-7577>

1.2. Objectives

The primary objective of this descriptive review was to gather contributions specifically related to the introductory aspects, definitions, classifications, onset, and historical foundations of stuttering research found in both Eastern and Western literature, utilizing the research entries available to the author.

2. Method

A survey method was used to gather article titles from national and international journals in linguistics, psychology, neuroscience, speech-language pathology, education, and communication sciences, as well as chapters and books on stuttering. It also explored reactions, legal and financial childcare aspects, advocacy, emotional support, and safe environments, although these topics were not included in this review. Searches were conducted using various online and offline databases, including Google Scholar, PsycINFO, ERIC, ResearchGate, Web of Science, and PubMed.

2.1. Procedure

After entering the raw data on reference listing in an Excel spreadsheet, the codification, categorization, and classification of the themes reflected by the titles included in the study were generated and subjected to inter-observer reliability checks by involving two mutually blinded independent coders for at least a quarter of entries in the overall sample of research articles to minimize the risk of bias which yielded a robust correlation coefficient ($r: 0.94$). A descriptive and interpretative statistical analysis was carried out by applying measures of non-parametric statistics using IBM SPSS Statistics (Version 27). Effect sizes were analyzed using Cohen's guidelines as 0.91 (Cohen, 2013), which is interpreted as an 'almost perfect agreement' (Landis and Koch, 1977). Face validity is high for the classification of the thematic categories covered by the research papers.

The compiled list of 511 entries till the search period ending October 2024, was subjected to bibliometric analysis by using a PRISMA flow diagram and harvest plot to depict the results (Table 1; Figure 1). The 20-item PRISMA2020 Checklist was adhered to. (Page et al. 2021). The study analyzed original research articles and reviews from various national and international journals, including English book titles and chapters with ISSN/ISBN information. It employed keywords such as introduction, definition, classification, religion, culture, and history of stuttering. Exclusions were made for descriptive essays, newsletters, unpublished works, and misleading references. Ethical considerations in stuttering research involve respecting diverse ethnic groups, ensuring patient autonomy and confidentiality, and being sensitive to participants' cultural backgrounds and vulnerabilities (Venkatesan, 2009).

3. Results

The bibliography compiled for this review, focusing on themes, includes 96 references drawn from a total of 511 sourced by the author, which were quantitatively analyzed (see Figure 1; Table 1). The analysis reveals that a majority of the available titles consist of original research articles (N: 69; 71.88%), books (N: 23; 23.96%), and chapters in books (N: 4; 4.17%). Historically, the earliest academic article on stuttering is attributed to Blair's "On Stuttering" (1786). Moreover, Hunt (1861) examined both the physiological and psychological aspects of stammering, emphasizing the importance of understanding its underlying mechanisms and critically assessing the therapeutic approaches of that time. As indicated in Table 1, interest in the review's selected topics surged around the turn of the millennium, with publication counts of 18 (18.75%) from 2001-2010, 16 (16.67%) from 2011-2020, and 20 (20.83%) post-2020. The review also highlights that an equal number of publications (N: 24; 24.74%) focused on historical aspects from the 18th and 19th centuries and comparative contributions from Eastern and Western cultures. The Journal of Fluency Disorders (N: 9; 9.38%), Journal of Communication Disorders (N: 20; 20.83%), and Journal of Speech and Hearing Disorders (N: 20; 20.83%) feature the highest publication counts in this review.

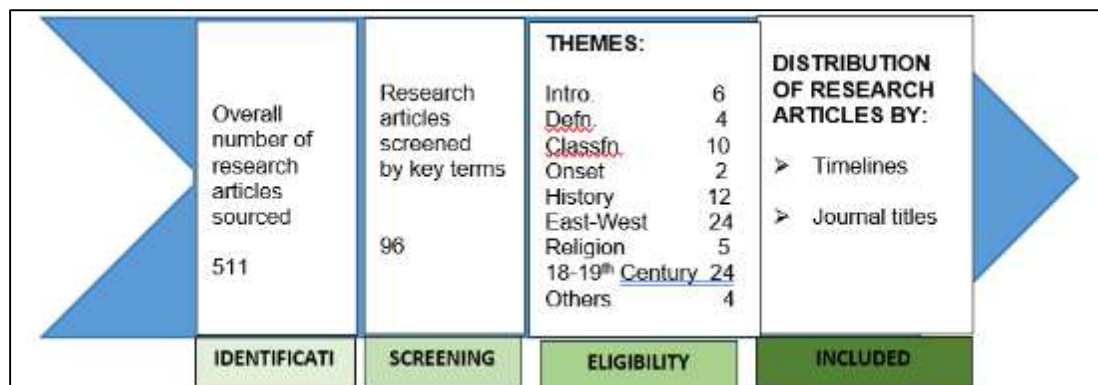


Figure 1 Prisma Flow Diagram depicting the procedure for review

Table 1 Frequency distribution of literature on stuttering research included in this review across various variables

Year/s	N	Themes	N	Title of Journal	N
<1900	2	Introduction	7	J. Fluency Disorders	9
1901-1910	3	Results	4	Communication Disorders	5
1911-1920	-	Definitions	4	J. Speech and Hearing Disorders	5
1921-1930	2	Classification	11	Others	77
1931-1940	2	Onset	2	Total	96
1941-1950	5	History	12		
1951-1960	4	East-West	24		
1961-1970	4	Religion	5	Format	
1971-1980	3	18-19 th Century	24	Original Reseaech Articles	69
1981-1990	13	Others	3	Books	23
1991-2000	5			Chapters in Books	4
2001-2010	18				
2011-2020	16				
>2020	19				
Total	96	Total	96	Total	96

4. Discussion

A theme-based discussion of the findings of this review is presented as follows:

4.1. Definition

The quest for a standard definition of stuttering has been ongoing for many years (Perkins, 1983; Wingate, 1964). Some researchers define it based on specific characteristics, while others focus on its etiology. A few even argue that the condition does not exist. Notably, the definition by Andrews et al. (1983) omits the term involuntary. However, most clinical forms of stuttering are indeed involuntary and largely beyond the individual's control (Yairi et al. 2001).

4.2. Classification

Stuttering is classified into three main types: developmental (common in children under five), acquired or neurogenic (related to brain, nerve, and muscle damage or abnormalities), and psychogenic (stemming from emotional trauma) (Rosenfield et al. 1991; Helm, Butler, and Benson, 1978). Another classification adds persistence (continuing from childhood into adulthood). Symptoms are categorized as repetitions, prolongations, pauses, broken words, incomplete phrases, and blocks. Distinctions are also made between monolingual and bilingual stuttering (Jayaram, 1983a; 1983b). Stuttering occurs more frequently in bilingual individuals, impacting both languages equally or in varying degrees (Van Borsel, Maes, and Foulon, 2001). A strong correlation between clinician-rated and self-rated severity of stuttering was noted among English-Kannada bilinguals (Veerabhadhrappa and Maruthy, 2023). Various situations, such as reading aloud alone, to one listener, or in front of a group, appear to influence bilinguals more significantly than monolinguals (Ghadei et al., 2022). Bilinguals are noted to take a longer time to discern the presence or absence of target consonants (Kumari et al., 2022). There are case reports of sudden onset respiratory blocking, termed respiratory stuttering, triggered by social stress, even in individuals with no prior dysfluency history (Watson and Guitar, 1986).

Recently, the ICF Model has illustrated that, beyond visible speech disruptions like part-word repetitions, prolongations, and blocks, many individuals who stutter face broader life impacts. These include challenges in social communication, such as engaging with others and making introductions, as well as job-related tasks like phone conversations and meeting participation. Such experiences have led the World Health Organization's International Classification of Functioning, Disability and Health (ICF) to encourage clinicians to recognize stuttering as a complex disorder, facilitating tailored treatment plans for those affected (Yaruss, 2007). Some ICD-11 codes for fluency disorders 6A01 as compared to R47.82 in ICD-10 (WHO, 2019).

4.3. Onset

Stuttering usually begins before age six and is often categorized as “atypical speech” or “normal non-fluency.” Approximately 70-80% of children experience spontaneous remission by adolescence. However, those who do not achieve fluency may develop secondary psychosocial symptoms, negatively impacting their quality of life (Yairi and Ambrose, 1992; Yairi, 1983).

4.4. History

The study of stammering has generated scientific interest, curiosity, and even discrimination. As early as 2500 BC, the Egyptians recognized stuttering, depicting it as a condition involving a thick, faltering tongue in their hieroglyphs (Johnson, 1944a; 1944b). Hippocrates (450-357 BC), father of medicine, attributed stuttering to an excess of black bile, suggesting treatments such as applying healing oils to the neck and throat. Other remedies included throat and tongue massages, consuming mustard, garlic, onions, and horseradish, washing the head in cold water, extending articulation, and practicing physical and respiratory exercises for breath control. Aristotle (384-322 BC) and the Greek orator Demosthenes recommended speaking with pebbles in the mouth to manage this speech defect. In the 18th and 19th centuries, surgical interventions were attempted, involving cuts to the tongues of affected children to improve mobility. Contemporary art represents PWS with large tongues and associated disabilities like deafness or blindness (Brosch and Pirsigb, 2001).

The Indians, Hottentots, and Aboriginal Bushmen of South Africa did not have a term for stuttering (Johnson, W. (Pillay and Kathard, 2015; Kathard and Pillay, 2013; Johnson, 1944a; 1944b). Notable figures like Isaac Newton and Prime Minister Winston Churchill were also known to stutter. Stuttering varies; individuals may stutter in public but not when singing or speaking alone. The prevalence of stuttering is five times higher in men than in women, potentially due to differences in brain wiring between genders (Briley, Merlo, and Ellis, 2022; Sudhi, John, and Geetha, 2010). References to stuttering can be found in the writings of ancient civilizations such as the Indians, Babylonians, Chinese, Palestinians, Egyptians, Greeks, and Romans. For instance, Hippocrates, the Greek physician, documented various speech disorders. In the medieval era, stuttering was often viewed through a mystical perspective, occasionally associated with demonic possession or divine punishment. Mythological figures like Hercules, Moses, Tiresias, Hephaestus, and Cassandra were depicted with speech impairments (Cicurel and Shvarts, 2003; Garfinkel, 1995). Additionally, Islamic texts recount Prophet Zechariah's speech challenges upon learning of his son (Bobrick, 2011).

4.5. East and West

Ancient Indian medical texts, including the Sushruta Samhita and Charaka Samhita, attribute stuttering to imbalances in the body's doshas (vital energies) and recommend treatments involving herbal remedies and lifestyle modifications. The Atharva Veda features hymns that highlight the importance of clear speech and rituals aimed at restoring it.

Swarnaprashan, a unique immunization practice mentioned in ancient texts, has been suggested since Vedic times to enhance memory, intelligence, immunity, and clarity of speech in children from birth (Saini et al., 2023; Nelaturi et al., 2021). Pāṇini, an ancient Sanskrit grammarian, addresses phonetics and the significance of accurate pronunciation in his work, *Ashtadhyayi*. Buddhist scriptures, particularly the Pali Canon, reference monks with speech difficulties, emphasizing mindfulness and meditation as means to overcome such issues. Additionally, Dhanvantari, the deity of Ayurveda, is frequently invoked in texts related to healing speech-related problems, reflecting the cultural value placed on clear communication in ancient Indian society (Balakrishnan, 2009; Savithri, 1987).

In Indian astrology, stuttering is associated with planetary influences and the Vishudha or Throat Chakra. Specific exercises such as Sahaj Shankh Mudra, Simhasana, Vrikshasana, and Ujjayi Pranayama emphasize breath control and posture to alleviate stuttering (Marks, 2013; Patry, 2004). Indian mythology features figures like Ganesha (who faces expression challenges), Bhishma (unable to speak due to vows), Draupadi (voicing her distress during humiliation), and Karna (portrayed with a sunken ear, symbolizing his outcast status) (Subramanian and Prabhu, 2005). Since Vedic times (5000-200 BC), Ayurveda has suggested remedies like chewing holy basil (Tulsi), black pepper, and ginger with rock salt, alongside ujjayi pranayama, to enhance clear speech (Rout, Kumar, and Kumar, 2014).

The perceptions and beliefs about stuttering vary among Islamic nations like Kuwait, Arabia, Sudan, Iran, and Pakistan, and Western countries (Iftikhar, Ishrat and Bukhari, 2022; Noor et al, 2021; Jafari et al. 2015; Vanryckeghem and Mukati, 2006). In many Islamic cultures, stuttering is often viewed through a mystical lens, sometimes interpreted as a manifestation of divine will or punishment. In contrast, Western societies typically adopt a medical or psychological perspective, focusing on speech therapy and intervention. Stuttering can carry a significant stigma in Islamic cultures, where fluency is closely linked to personal and social success, leading to potential discrimination. While stigma also exists in the West, there tends to be greater awareness and acceptance, resulting in more supportive environments. Access to speech therapy may be limited in some Islamic countries due to fewer healthcare resources and lower awareness. Additionally, community and family opinions heavily influence attitudes toward stuttering in Islamic cultures, whereas Western societies emphasize individual empowerment (Shakeel, Saqulain, and Maryam Shakeel, 2021). Educational systems in Islamic nations often lack specific training for teachers, unlike the more inclusive practices found in Western education. Public awareness campaigns aimed at reducing stigma are more prevalent in Western countries, reflecting the cultural and institutional differences in addressing stuttering (McConnell, 2022; Üstün-Yavuz et al. 2021).

Several myths, misconceptions, and mysteries about stuttering continue to thrive in laypersons. Stuttering is viewed as the outcome of an individual's moral failure owing to which supernatural evil forces are presumed to reside and hold back one tongue while speaking (Isaacs, 2021). PWS are viewed as damned, bringing bad luck to society, or as possessed by evil spirits (Singh and Kumar, 2022). Such persons are viewed as temperamentally anxious, nervous, shy, self-conscious, not as clever as others, less intelligent, incapable, and over-stressed. It is considered all right to complete a sentence for a person for them if they are stuttering. The condition results when a person has a thick or dry tongue, faulty breathing patterns, unusual brain morphology owing to their past life deeds (karma), or if one is forced into right-handedness as a child, who is naturally born as left-handed (Bloodstein, Ratner and Brundage, 2021). Based on concordance rates in twin studies, family aggregation, and genotyping, many believe that stuttering is a genetic problem that runs in families (Kraft and Yairi, 2012) or that there are specific medicines that cure the problem. The condition can result from divine interventions, if one whistles at night, teases another person who is stuttering, or if one plays in the rain in the night (Sibanda and Mothapo, 2024). In some tribal communities, treatments for stuttering involve the use of talismans, rituals, magic spells, and formulae, or even cruel unusual practices like starvation, strangulation, cutting, and burning (Sandhya et al. 2021; Simon, 2011). Reported myths in African American cultures believe that people are born with the condition or that it is stuttering is caused by the mother eating improper foods while breastfeeding, allowing an infant to look into a mirror, tickling the child too much, cutting the child's hair before the first word is uttered, the mother seeing a snake during pregnancy, or if the child being scared as a baby (Robinson and Crowe, 1998).

4.6. Religion

Religion has often been utilized as a means of engaging in discourse with the supernatural to comprehend, explain, and address human challenges. Moses, regarded as the foremost Prophet, is noted for his speech impairment, characterized as a man of "few words" with "slow speech and tongue" (Falconer and Liroy, 2018). Research on stuttering within Islam highlights the positive influence of the Holy Quran, which aids in enhancing pronunciation, expanding linguistic skills, and improving communication (Mohamed, 2024). However, religious beliefs can also foster obstacles, such as negative stereotypes and misunderstandings about the acceptance and treatment of PWS. In Kuwaiti society, for instance,

widespread ignorance and confusion about stuttering exist, with some cultural beliefs attributing it to divine origins or supernatural forces like "ghosts" and "demons" (Nabieh El-Adawy et al. 2021; Chu et al. 2022; Al-Khaledi et al. 2009).

4.7. Turn of 18-19th Century

Grierson (1902) utilized observational reports and case studies to address the medical and scientific viewpoints, causes, symptoms, and possible treatments for stuttering. He also wrote other relevant works, including "The Psychology of Stammering" (1904), "Stammering and its Treatment" (1910), and "The Treatment of Stammering" (1920). Beasley (1902) provided a professional and biographical overview of the experiences and treatments available at the time, emphasizing the impact of stress and anxiety. He discussed speech therapy, breathing techniques, self-acceptance, and positive reinforcement as methods to enhance recovery. Lewis (1903), who developed the phonometric method for a lasting cure for stuttering, examined personal experiences, the anatomy of speech organs, and the origins of stammering in children. His work included diagnosis, treatment options, exercises, causes, home remedies, and career advice with limited social interaction, distinguishing between stammering and stuttering while identifying fear, health issues, and breathing habits as contributing factors.

Bogue (1922) presented stammering through a child's perspective, sharing personal accounts of their distress and outlining their needs for support at home, school, and social settings. Early discussions on the topic were largely speculative and based on assumptions, while communication sciences and disorders emerged as a formal discipline in the 1930s-40s with the emergence of modern speech clinics (Wingate, 1997; Robinson, 1964; Johnson and Leutenegger, 1955; Kingbell, 1939). Early risk factors linked to stuttering included low birth weight, multiple births, and lack of a birth cry (Berry, 1938). Bluemel (1960) identified various treatment methods of the time, such as correspondence courses on respiratory, vocal, and articulatory exercises, tongue surgery, mechanical devices for the mouth, and time-beating machines to regulate speech. Holtzman (1960) discussed both traditional and modern research directions in stuttering. Stevenson (1968) revived surgical interventions for stuttering by reflecting on historical practices, including the use of artificial palates, obturators, teaching methods for the deaf, descriptions of aphasia, and previous surgical attempts and voice training experiences in speech clinics.

No distinctions were earlier made between stuttering, cluttering, some forms of dysarthria, functional articulation problems, and aphasia (Rieber and Wollock, 1977). Humoral physiology was then deemed as the underlying common cause for all speech defects including stuttering. It was much later that kinematics, movements, and mechanical aspects of speech and understanding the development of speech in children were understood as necessary to understand adult stuttering (Starkweather, 1987; Gregory, 1986; McNarnee, 1984). It was in the 1980s that evidence-based therapies for stuttering like self-management and Cognitive Based Therapies took shape (Etchell et al. 2018; Prins and Ingham, 2009).

The Renaissance beginning from the late 14th to lasting till the 18th century and spreading through Europe brought the shifts towards more rational explanations. In the 19th century, clinical approaches to understanding stuttering were introduced. Research began to explore psychological factors. Treatments became more structured (Hawk, 1928). The development of speech therapy as a profession in the early 20th century led to more effective treatments. The work of figures like Charles Van Riper, who developed the "fluency-shaping," "first aid," and "stuttering modification" techniques, significantly influenced modern therapy (Glicklich, 1950; Van Riper, 1947; Heltman, 1943). Today, stuttering is recognized as a complex speech disorder influenced by genetic, neurological, and environmental factors. Research continues to evolve, focusing on both treatment and the experiences of individuals who stutter (Levid, 2009; Discord, 1990). A multidisciplinary approach is recommended for undertaking the research studies on this subject (Crowe, Davidow, and Bothe, 2004; Craig, 2003; Blaesing, 1982; Falck and Falck, 1961).

5. Conclusion

Research on stuttering encompasses various fields, including linguistics, psychology, speech-language pathology, neurology, audiology, education, communication sciences, sociolinguistics, genetics, and cognitive science. These disciplines work together to deepen our understanding of the complex nature of stuttering. While a detailed narrative review could further explore their individual and collaborative contributions, key advancements include cognitive behavior therapy and developmental stuttering insights from child psychology, speech production models from linguistics, brain imaging studies in neuroscience, auditory feedback research in audiology, and evidence-based practices from speech-language pathology, along with curriculum development in special education and diverse therapeutic approaches.

Recommendations

This review suggests that future research should include a detailed literature review focused on historical studies and theories essential for understanding stuttering. It can analyze the socio-cultural and scientific contexts that have shaped such research, including pivotal historical events that influenced perceptions and treatments. Key researchers and their contributions must be separately highlighted to illustrate how their work has impacted current understanding and treatment approaches. Additionally, the evolution of theories can be explored, from early beliefs to modern neurological and psychological perspectives. Insights from diverse fields, such as psychology, linguistics, and neurology, should be integrated for a well-rounded perspective. Finally, future research opportunities should be identified based on historical gaps or emerging trends, alongside a discussion of ethical considerations in contemporary research practices.

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