

Literature Review on Epidemiology of Aphasia with a Focus on Incidence

Yasash Gorusu, Department of Audiology and Speech-Language Pathology, Texas Academy of Mathematics and Science

Dr. Gloria Olness, Department of Audiology and Speech-Language Pathology, College of Health and Public Service

BACKGROUND

This study focuses on epidemiology and incidence of aphasia. Aphasia is a communicative disorder that results from brain damage often due to stroke. Aphasia impairs the ability to understand and produce language. Aphasia may hinder the person's ability to comprehend what people say or write or express themselves through speaking or writing [13]. Stroke or cerebrovascular accident is the lack of oxygen received by a portion of the brain. Ischemic stroke is caused by an embolism and is the most common type of stroke [14].

Epidemiology is the study of the causes of disease and how they spread. This study focuses on the incidence and prevalence of aphasia. Incidence is the occurrence of a disease in the population during a specific period of time. Prevalence is defined as the occurrence of disease in a population in present time [14].

Most of the literature reviewed focused on the incidence of aphasia among first-time ischemic stroke patients. None of the literature focused on the prevalence of aphasia.

THESIS

The purpose of this review is to critique, compare, and contrast the methodological approaches to the epidemiology of aphasia.

METHODS

The articles gathered for this literature review reflects a conventional process of entering search terms into large databases. The combined search terms 'aphasia AND epidemiology,' 'aphasia AND incidence,' and 'aphasia AND prevalence' were entered 'Google Scholar,' 'Microsoft Academic,' 'CORE,' and 'PubMed.gov.' The search results were then sorted by original sorting settings of the respective databases. For example, there were no date restrictions and results were not sorted in a certain way. Once important and reoccurring articles were noted, gathering articles continued cited references in those articles were

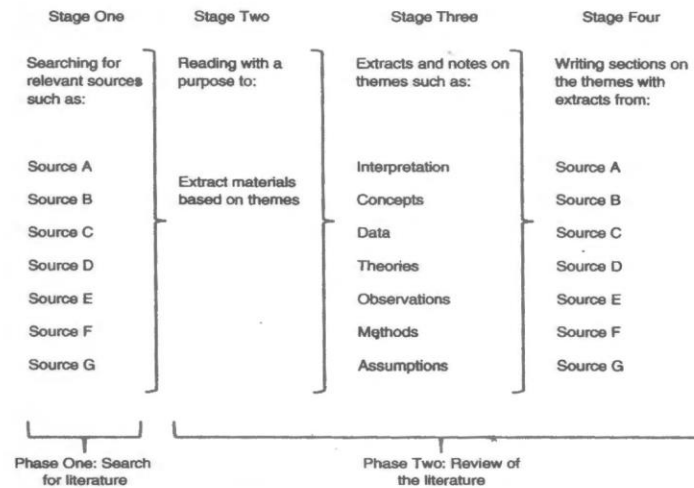


Figure 1. Highlights methodology for this literature review [8].

METHODS – cont.

Articles that couldn't be retrieved in pdf format via databases were then searched in external libraries. These libraries included the UNT Library and UNT Interlibrary Loan. Articles that were in languages other than English were translated into Google Translate for documents. All articles were noted in an Excel sheet along with the notes of each article for analysis.

Figure 1 shows the approaches mentioned earlier. Stage One representing the literature search. Stage two represents the reoccurring themes among all the articles. The themes identified were location of sample, population, aphasia operationalization, stroke, and incidence in each of the articles. Stage three is gathering of information based on the themes. Stage four is analysis of the extracted information that is gathered from the themes.

RESULTS AND DISCUSSION

A total of 25 articles were identified through the search terms and databases mentioned. 16 out of the 25 articles were considered relevant for analysis. These 16 articles reported incidence and methods to determine the incidence of aphasia. 9 out of the 25 articles were considered irrelevant. These 9 articles focused on the outcomes for aphasiacs or didn't focus on incidence or prevalence of aphasiacs.

Patient sample was covered based on ambition of overall articles. 8 articles used regional patient databases to source their stroke population. 7 articles focused on an observational study at hospital(s). The 8 studies were clearly more focused on epidemiology whereas the 7 articles focused on the outcomes for the patients.

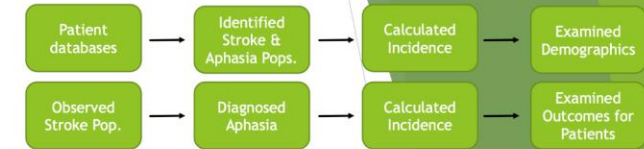


Figure 2. Depicts the process of how most of the epidemiological studies were conducted.

RESULTS AND DISCUSSION - Continued

All but two articles found the incidence of aphasia patients among first ischemic stroke patients. One of the two articles found aphasia incidence in entire US inpatient data of 2006 [3]. The other article found incidence over general stroke population [12]. The focus on first ischemic stroke patients minimizes the application of information to a narrower scale.

Majority of the aphasia was operationalized by using speech-language pathologists. Only 4 articles listed the aphasia tests that were used to determine Aphasia [4][11][12][15]. Some articles did not mention how aphasia was operationalized because of the use of databases. The inconsistent screening for aphasia is a variable that could attribute to the inconsistent aphasia incidences. Similarly, numerous amounts of tests and processes were used to screen for aphasia. Factors like language, dialect, education, healthcare cost may affect testing and subsequently incidence rates. Future precautions when researching with incidence on aphasia would be to set standards for the operationalizing aphasia. This will remove potential differences in aphasia. This project will be involved in a greater project of comparing healthcare outcomes to patients with stroke and patients with stroke and aphasia.

REFERENCES

- [1] Ali, M., et al. Aphasia and Dysarthria in Acute Stroke: Recovery and Functional Outcome. *International Journal of Stroke*, 10(3), 400-406.
- [2] Dickey, L., et al. (2010). Incidence and profile of inpatient stroke-induced aphasia in Ontario, Canada. *Archives of physical medicine and rehabilitation*, 91(2), 196-202.
- [3] Ellis, C., et al. (2010). Longitudinal trends in aphasia in the United States. *Neurorehabilitation*, 27(4), 327-333.
- [4] Engelter, S., et al. (2006). Epidemiology of aphasia attributable to first ischemic stroke: Incidence, severity, fluency, etiology, and thrombolysis. *Stroke*, 37, 1379-84.
- [5] Flowers, H., et al. (2016). Poststroke aphasia frequency, recovery and outcomes: A systematic review and meta-analysis. *Archives of Physical Medicine and Rehabilitation*, 97(12), 2188-2201.
- [6] Gialanella, B., et al. (2011). Predicting outcome after stroke: the role of aphasia. *Disability and Rehabilitation*, 33, 122-129.
- [7] González, F., et al. Incidencia poblacional, características epidemiológicas y desenlace funcional de pacientes con ataque cerebrovascular isquémico y afasia. *Revista Médica de Chile, Revista Médica de Chile*, 145, 194-200.
- [8] Hart, Chris. (2018). *Doing a literature Review: Releasing the Research Imagination*. Sage Publications. [9] Inatomi, Y., et al. (2008). Aphasia during the acute phase in ischemic stroke. *Cerebrovascular diseases (Basel, Switzerland)*, 25(4), 316-323.
- [10] Kadojic, D., et al. (2012). Aphasia in patients with ischemic stroke. *Acta Clinica Croatica*, 51, 221-225.
- [11] Lahiri, D., et al. (2020). Incidence and types of aphasia after first-ever acute stroke in Bengali speakers: age, gender, and educational effect on the type of aphasia. *Aphasiology*, 34(6), 709-722.
- [12] Laska, A., et al. (2001). Aphasia in acute stroke and relation to outcome. *Journal of internal medicine*, 249(5), 413-422.
- [13] Law, J., et al. (2009). The incidence of cases of aphasia following first stroke referred to speech and language therapy services in Scotland. *Aphasiology*, 23(10), 1266-1275.
- [14] Lima, R., et al. (2020). Prevalence of aphasia after stroke in a hospital population in southern Brazil: a retrospective cohort study. *Topics in stroke rehabilitation*, 27(3), 215-223.
- [15] National Aphasia Association. (2018, June 20). *Aphasia Definitions*. <https://www.aphasia.org/aphasia-definitions/>.
- [16] National Institute of Health. (2017, February 7). *What is Epidemiology?*. <https://www.nidcd.nih.gov/health/statistics/what-epidemiology>.
- [17] Pedersen, P. et al. (1995). Aphasia in acute stroke: incidence, determinants, and recovery. *Annals of neurology*, 38(4), 659-666.
- [18] Pedersen, P. et al. (2004). Aphasia after stroke: type, severity and prognosis. The Copenhagen aphasia study. *Cerebrovascular diseases (Basel, Switzerland)*, 17(1), 35-43.

ACKNOWLEDGMENTS

Dr. Gloria Olness — Mentorship and Guidance for this project
 Dr. James Duban & Valerie Adell — Giving opportunity for Summer Research Scholarship
 2020 TAMS Summer Research Scholarship
 Texas Academy of Mathematics and Science