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Shiraz Nursing Home Adults with Parkinson and Alzheimer Disorder Speech production comparison

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Abstract. This project aims is to compare speech disorders performance in two senior adults group whom suffered from Alzheimer or Parkinson disease and looking for most affective factors can improves such performance base of these speech patterns similarities.it is analytical descriptive research with two group of elders in age rang 50 to 92 in women's shiraz nursing home .two sessions in week for one month's thirty minutes each time were considered to have an interview with selected participants and two especial test as an research target (MMSE and spear man)was administrated then In analyzing data and answering the main research questions, Correlational devices was used to find the relationships between two groups, in this regards, the researcher used statistical descriptive measurements such as mean, standard deviation and one-way ANOVA with SPSS software And for analyzing comparison between two groups, T-Test was used. The statistical analysis of collected data showed that the people with Alzheimer disease had more problems in word repetition in their speech than the group with Parkinson but those group with Parkinson deficit had more comprehension or stating complex structures or cohesively in their sentences.at last a few prevention methods was suggested to reduce risk of developing impaired speech for both target groups.

This article is a kind of descriptive research about comparison speech and language disorders in two healthy and Alzheimer's dieses adults in age range between 52 to 92in Shiraz nursing home. In old age of life speech disorder phenomenon is one of the most serious problems which results to all seniors' isolation from family and society and also act as an important barrier in their normal communications. The collected data showed that Among all studied seniors in this research ones with Alzheimer disease had more problem that the normal ones in all part of speech branches but with different levels of suffering much especially in comprehension of complex sentences and sentence production as they faced with difficulty in remembering the words as their short memory lack. Also the researches showed the significant differences in length of the produced sentences (P< .05) by using tree test spirman, mini mental state examination and walker. This article also refers to some applicable solutions to reduce such as these disorders especially in both studied groups.

Keywords: Alzheimer's disease, aphasia, speech disorder, neuropsychological tests, Parkinson's disease,Shiraz

Introduction

Speech is the verbal means of communicating. Speech consists of the following:

- Articulation: How speech sounds are made
- Voice: The use of the vocal folds and breathing to produce sound (e.g., hoarseness, breathiness, projection)
- Fluency and prosody: The rhythm, intonation, stress, and related attributes of speech

When someone has trouble understanding other people (receptive language), or explaining thoughts, ideas and feelings (expressive language), that is a language disorder.

When someone cannot produce speech sounds correctly or fluently, or has voice problems, that is a speech disorder.

Most developed world countries have accepted the chronological age of 65 years as a definition of 'elderly' or older person .Adults may experience speech and language difficulties for a variety of reasons. Information about specific types of speech and language differences and disorders, as well as conditions that cause them is included below.

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Speech Disorders

- Apraxia
  - Apraxia of speech is a motor speech disorder. The messages from the brain to the mouth are disrupted, and the person cannot move his or her lips or tongue to the right place to say sounds correctly, even though the muscles are not weak. The severity of apraxia depends on the nature of the brain damage.
- Individuals with apraxia may demonstrate:
- Difficulty imitating and producing speech sounds, marked by speech errors such as sound distortions, substitutions, and/or omissions
- inconsistent speech errors
- Groping of the tongue and lips to make specific sounds and words
- Slow speech rate
- Impaired rhythm and prosody (intonation) of speech
- Better automatic speech (e.g., greetings) than purposeful speech
- Inability to produce any sound at all in severe cases.

- Dysarthria
- Dysarthria is the result of incoordination or weakness of the speech mechanism. Speech may be slurred or difficult to understand. Parkinson's, multiple sclerosis, as well as strokes, can cause dysarthria. A person with dysarthria may demonstrate the following speech characteristics:

- "Slurred," "choppy," or "mumbled" speech that may be difficult to understand
- Slow rate of speech
- Rapid rate of speech with a "mumbling" quality
- Limited tongue, lip, and jaw movement
- Abnormal pitch and rhythm when speaking
- Changes in voice quality, such as hoarse or breathy voice or speech that sounds "nasal" or "stuffy"

- Stuttering
- Stuttering affects the fluency of speech. It begins during childhood and, in some cases, lasts throughout life. The disorder is characterized by disruptions in the production of speech sounds, also called "disfluencies." Most people produce brief disfluencies from time to time. For instance, some words are repeated and others are preceded by "um" or "uh." Disfluencies are not necessarily a problem; however, they can impede communication when a person produces too many of them.

- Voice
- Surgical removal of the larynx (voice box) due to cancer and other forms of disease may result in complete or partial loss of the voice. Voice is a problem when loudness, quality or pitch are inadequate for communication.

- Hoarseness
- Breathiness
- A "rough" voice
- A "scratchy" voice
- Harshness
- Shooting pain from ear to ear
- A "lump in the throat" sensation
- Neck pain
- Decreased pitch range
- Voice and body fatigue

- Breathy voice
- Inability to speak loudly
- Limited pitch and loudness variations
- Voicing that lasts only for a very short time (around 1 second)
- Choking or coughing while eating
- Possible pneumonia due to food and liquid being aspirated into the lungs (the vocal cords cannot close adequately to protect the airway while swallowing)

Disorders of speech and communication that affect the elderly population may result from stroke, cancer, disease of the larynx, Parkinson's disease, or other neurological disorders. They vary widely and include difficulty speaking and understanding verbal and/or written information. In many cases, the effects of speech impairments may be overwhelming and frustrating for the patient and caregiver.

Objective and significance of study

This study sought to compare two common adults speech disorders (Alzheimer and Parkinson) to find the similarities which aims to be based on the elders' real needs, interests, capabilities , to help them to act more successful in their real life communications)

Literature Review

Two most common diseases between elders especially after age 60 are Alzheimer and Parkinson.

Adults may experience speech and language difficulties for a variety of reasons. Information about specific types of speech and language differences and disorders, as well as conditions that cause them is included below.

Speech impairments may be present in different forms. Adult-impaired speech is a symptom of several different speech disorders. They include: (Ashley, J., Duggan, M., & Sutcliffe, N. (2006)

- **Spasmodic dysphonia**: identified by involuntary movements of the vocal cords when speaking. Your voice may be hoarse, airy, and tight
- **Aphasia**: the inability to express and comprehend language. Individuals with aphasia may find it difficult to think of words. They may also mispronounce words
- **Dysarthria:** weak vocal muscles. These weak muscles cause slurred and slow speech. The larynx (voice box) and vocal cords have difficulty coordinating to make a fluent sound
- **vocal disturbances**: any factor that changes the function or shape of your vocal cords can cause changes in the sound and ease of speech

Alzheimer's disease is the most common cause of dementia. The word dementia describes a set of symptoms that can include memory loss and difficulties with thinking, problem-solving or language. These symptoms occur when the brain is damaged by certain diseases, including Alzheimer's disease. This factsheet describes the symptoms of Alzheimer's disease, how it is diagnosed, and the factors that can put someone at risk of developing it. It also describes the treatments and support that are currently available.

There are some common symptoms of Alzheimer's disease, but it is important to remember that everyone is unique. Two people with Alzheimer's are unlikely to experience the cond Memory loss due to Alzheimer's disease increasingly interferes with daily life as the condition progresses. The person may:

- Lose items (eg keys, glasses) around the house
- Struggle to find the right word in a conversation or forget someone's name
- Forget about recent conversations or events

- Get lost in a familiar place or on a familiar journey
- Forget appointments or anniversaries.(Mace, N., MA and P. Rabins, MD, MPH. (1991))

Alzheimer's is a progressive disease. This means that gradually, over time, more parts of the brain are damaged. As this happens, more symptoms develop. They also become more severe.

Aronson, A. E., & Brown, J. R. (1975) stade : Parkinson's disease (PD) is a progressive disorder of the central nervous system which affects especially after age fifty years old.

Some people with PD experience changes in cognition and language, which make it difficult to think quickly, to manage multiple tasks, to find words or to understand complex sentences.

These changes, even if subtle, can make it challenging for a person with Parkinson's to follow a conversation.

People with PD can have difficulty recognizing both words and facial expressions that convey emotions. At the same time, they may speak with a 'flatter' voice and make fewer expressive facial expressions, meaning that their faces communicate less meaning to their listeners. The same goes for physical gestures. Body language adds emphasis to a speaker's words, but in PD the speaker often has a compromised ability to make gestures.

Adams, S. G. (1994) ;About 90 percent of people with PD will experience changes in their voices or their ability to make speech sounds at some stage of their lives. Most commonly, the voice becomes quieter. It can also develop a breathy or hoarse quality. These changes may make a person's speech less precise and more difficult to understand, especially when speaking to partners who have hearing loss. Researchers believe that these symptoms are due to brain changes that make it difficult to follow internal cues, telling us how loud the voice should be or how much effort is required to produce clear speech.

Methodology and result

The simple title was given to participants and ask to make a story or taking a bout the subject base on their past experience a cording to selected topics or testing the rate of their aphasia (WAB test) or word finding (TAWF) arranged sessions. In each session, the essays were collected and a new topic was given to the students for the next session.it is analytical descriptive research with two group of elders in age rang 50 to 92 in women's shiraz nursing home .two sessions in week for one month's thirty minutes each time were considered to have an interview with selected participants and two especial test as an research target (MMSE and spear man)was administrated then In analyzing data and answering the main research questions, Correlational devices was used to find the relationships between two groups, in this regards, the researcher used statistical descriptive measurements such as mean, standard deviation and one-way ANOVA with SPSS software And for analyzing comparison between two groups, T-Test was used. The statistical analysis of collected data showed that the people with Alzheimer disease had more problems in word repetition in their speech than the group with Parkinson but those group with Parkinson deficit had more comprehension or stating complex structures or cohesively in their sentences.at last a few prevention methods was suggested to reduce risk of developing impaired speech for both target groups.in total with considering all

The main test of research was a free speech about how to a rainy day and related pictures,

In this test although a lot of time was consumed the process of word production on Alzheimer group was a little bit slower than the Parkinson one but in descriptive and comprehension part there were more successful although in this test the produced sentences had an scatter cohesion the Alzheimer patient showed more solidarity in their speech produced sentences.

Table 1. Descriptive Statistics.

SD	Mean	Number	Groups
2.39	24.67	33	Parkinson group
3.70	32.69	33	Alzheimer group

Table 2. Independent Semple t-test.

Sig	Degree of freedom	statistics t	Variable
0.19	64	-1.32	Alzheimer group
0.08	64	-1.25	Parkinson group

Instrument

The instruments of the study were passages and a bout free speech conversation which is based on the partisans interests and the 5 side administered tests Cranach's alpha coefficient (more than <.7) to confirm reliability of taken tests; Cronbach, L. J. (1951)

Participants

The participants were chosen from nursing home institute in Shiraz. They were native speakers of Persian and consisted of 33 males within the age range of 52 to 92.there were homogenous in sex but in definite mentioned age range.

Discussion and Conclusion

The statistical analysis of collected data showed that the people with Alzheimer disease had more problems in word repetition in their speech than the group with Parkinson but those group with Parkinson deficit had more comprehension or stating complex structures or cohesively in their sentences.

Parkinson's disease patients commonly suffer from speech and vocal problems including dysarthria speech, reduced loudness and loss of articulation. These symptoms increase in frequency and intensity with progression of the disease). Speech and language therapy (SLT) aims to improve the intelligibility of speech with behavioral treatment techniques or instrumental aids.

Gathered data collection results showed The initial symptoms of semantic dementia often involve problems with finding the right words during conversation which is very similar to Parkinson disorder which are bilateral deterioration of the temporal lobes (particularly anterior) leads to:

- Problem in fluent speech production,
- Fluent, grammatically correct speech with little meaning
- Poor comprehension
- Para aphasic errors
    - Calling a spoon a "fork" (semantic)
    - Calling a spoon a "spood" (literal)
- Neologisms (or nonsense words)
- Loss of word and object meaning,
- Relatively preserved comprehension
- Deficits in comprehending the emotions of others.

Also one other similarity that these diseases have which leads to similar speech disorders the role of increase age has a direct effect on rate of disease growth and the sociality rate of person also can decrease growth of both these diseases.

The achieved data indicate following similarities in structure of these mentioned diseases speech production limit addressor comprehension ability:

- Significant role of age in testify the diseases growth process by limited memory power and fatigue feeling.
- Produced short and un proximate sentences
- Reduce reading and comprehension power
- Reduce speech rate

- Reduce speech complicity level
- Reduced communication skills
- And serious words pronunciation and phonological problems

A few prevention methods can reduce risk of developing impaired speech in both Alzheimer and Parkinson patients, as many impairments result from trauma. Some lifestyle habits they can adopt to help prevent the onset of impaired speech include :

Suggestion for elders with Alzheimer's:

- Not overusing their voice by screaming or placing stress on their vocal cords
- Quitting smoking, as smoking is linked with throat cancers
- Decreasing their risk of a stroke by exercising frequently, regulating diabetes, maintaining a healthy blood pressure, and reducing bad cholesterol levels
- Seeking prompt medical help for unusual symptoms
- Limiting alcohol use
- Avoiding vocal-impairing drugs, such as caffeine, amphetamines, and antidepressants

Suggestion for elders with Parkinson's:

- Choose an environment with reduced noise. It can be tiring to try to "talk over" the television or radio.
- Ask them to speak slowly.
- Tell them to make sure that their listener can see their face(this is especially effective for Parkinson patience)A well-lit room enhances face-to-face conversation, increasing understanding.
- Teach them how to use short phrases it means they should Say one or two words or syllables per breath.
- Over-articulate their speech by prolonging the vowels and exaggerating the consonants.
- Choose a comfortable posture and position that provide support during long and stressful conversations.
- Be aware that exercises intended to strengthen weakening muscles may be counter-productive. Always ask your speech therapist which exercises are right for you.
- Plan periods of vocal rest before planned conversations or phone calls. Know that fatigue significantly affects your speaking ability. Techniques that work in the morning may not work later in the day.
- If you are soft spoken and your voice has become low, consider using an amplifier.
- If some people have difficulty understanding you, the following strategies may help:
- If you are able to write without difficulty, always carry a paper and pen as a backup so you can write down what you are trying to say.
- If writing is difficult, use an alphabet board to point or scan to the first letter of the words that are spoken.
- Spell words out loud or on an alphabet board if they are not understood.
- Establish the topic before speaking.
- Use telegraphic speech. Leave out unnecessary words to communicate the meaning of the topic.

Limitation of Study:

- Due to time-consuming nature of the evaluation and scoring of the argumentative essays, the size of the sample was not so large. Their level of proficiency and age range were definite

References

[1] Darley, F. L., Aronson, A. E., & Brown, J. R. (1975). Motor speech disorders. Philadelphia: W. B. Saunders, Co

[2] Adams, S. G. (1994). Accelerating speech in a case of hypokinetic dysarthria: Descriptions and treatment. In J. Till, K. Yorkston, & D. Beukelman (Eds.), Motor speech disorders: Advances in assessment and treatment (pp. 213-228). Baltimore: Paul H. Brookes Publishing Co.

[3] Ashley, J., Duggan, M., & Sutcliffe, N. (2006). Speech, language, and swallowing disorders in the older adult. *Clinics in Geriatric Medicine*, 22. Retrieved from

[4] Mace, N., MA and P. Rabins, MD, MPH. (1991) The 36-Hour Day, revised edition. Baltimore: Johns Hopkins University Press.

[5] Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. Psychometrika. 16, 297-334.