

Developing an Application for the Diagnosis of Aphasia in Arabic

Tariq A. Khwaileh

Researchers at Qatar University in the field of English Language and Linguistics under the supervision of Dr. Tariq Khuwaila developed a diagnostic test for patients with aphasia that results from a stroke. This project was implemented to be the first initiative of its kind in Qatar and the Arab world to serve the health sector in Qatar and Arab patients, especially those speaking the Gulf dialect who suffer from aphasia (the inability to speak and understand speech as a result of an injury in the language processing centers in the brain). Discovering aphasia cases relies on studying diagnostic tests translated from the English language, which do not take into account the linguistic and cultural differences that exist in the Arabic language. These diagnoses can be inaccurate making it difficult for doctors to find suitable solutions for the treatment.

This project comes in response to the Qatar National Vision 2030 regarding the health sector, which is one of the most important aspects of human development strategies, given that the people of Qatar have the right to secure a high standard of living in the future. Progress in this sector contributes to the success of the Qatar National Vision as it has an impact on the quality of life of the population in Qatar and their productivity in society. The health component and the availability of an integrated health system would participate in the development and progress of the State of Qatar in all areas. Qatar cares about this field as the country contributes to invest in projects that guarantee its share in the success of the health sector within the framework of the state's future vision.

The researchers aim to develop a database that focuses on the audio-visual linguistic influences in the Arabic language, specifically the Gulf dialect, to serve those with aphasia and are affected by the symptoms of a stroke. Furthermore, this diagnostic test is developed so it can be changed to study various Arabic dialects, taking into consideration the different linguistic and cultural characteristics in these dialects.

This diagnostic examination in Arabic for people with aphasia helps neurologists and speech and hearing specialists to identify problems affecting the patient after a stroke and to assess the patient's linguistic ability to pronounce and understand by identifying areas of weakness in the brain of people with aphasia. These tests include a check for sound outputs and other tests that focus on how simple words, their types, and how other complex words are pronounced, as well as examinations of linguistic structures and sentences of all kinds. These tests diagnose the patient's morphological, derivative, and grammatical ability. After investigating the patient's condition and conducting all checks, these results are converted into figures so that certain statistical tools can be used to facilitate the analysis of these results, called "numerical results". Then, these numbers will be converted back to specific

conclusions describing the patient's condition and injury. With the help of these conclusions, the specialist in charge can develop a treatment in line with the patient's condition and draw up an integrated treatment plan for the patient, as it varies from one patient to another according to the severity of the symptoms and the extent of his/ her influence as a result of the stroke, especially aphasia. Currently, there are no tests that provide sufficient diagnostic tools to serve the accurate diagnosis of Arabic speaking patients with aphasia. What specialists currently use is tests translated from the English and French languages, which is considered an obstacle in determining the case accurately and sufficiently, because it does not take into account the patient's linguistic and cultural background. Thus, these specialists and patients are in urgent need of such developed test to serve them to diagnose the problem in an ideal and required manner to avoid wrong diagnoses that may increase the severity of symptoms and cause the aphasia to continue without being accurately addressed.

This project aims to implement a diagnostic examination in the Arabic language for people with verbal aphasia in neurosurgery and speech clinics in the region's hospitals, starting from Hamad Medical Hospital to all GCC countries, as well as western hospitals outside the Arab world that receive Arab patients. This diagnostic analysis will be a software application that facilitates the use of doctors and specialists in hospitals and clinics. On the other hand, this project aspires to put the first imprint in the field of medical science supporting the development of such examinations and databases so that they can be used in the field of linguistic research, as it is limited in the Arab world. We hope that this project will contribute to the development of hearing and speech therapy for patients with verbal aphasia to develop the health sector of the State of Qatar and participate in achieving its national vision 2030. This would set a positive path and great hope for stroke patients with verbal aphasia in order to avoid misdiagnosis of the patient's condition. This project is under experiment, as it is applied to several patients with aphasia to prove the validity and accuracy of the current diagnostic analysis, and work is being done to complete it for publication this coming August.

Dr. Tariq A. Khwaileh is the Head of the Department of English Literature and Linguistics at Qatar University. Since 2016, he has been a Research Fellow of the Department of Human Communication Sciences at the University of Sheffield, United Kingdom. Specialized in clinical linguistics and psycho-neurolinguistics, his main research interest is developing clinical tests for patients with Aphasia, and language processing in the mind and brain, with special reference to Arabic. Dr. Khwaileh presented in international and specialized conferences, and published journal articles in scientific and indexed journals specialized in the fields of psycholinguistics, neurolinguistics and clinical linguistics.