Specific Aphasia Screener in Urdu (SAS-U): Its Development and Reliability

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ABSTRACT

Objective: To develop specific aphasia screener for adults in Urdu language.

Study Design: Comparative cross Sectional study.

Place and Duration of Study: Speech therapy clinic of National Institute of Rehabilitation Sciences, Islamabad Pakistan, from Nov 2016 to Apr 2017.

Methodology: A specific aphasia screener in Urdu was developed by an expert committee, relevant to local clinical and cultural setting, pilot tested, revised and used in main. Sample size was attained using consecutive sampling technique. Sample included 50 aphasic adults aged 40-70 of both genders, divided into 25 being allocated in Control Group and 25 in experimental group. Experimental group was subjected to the Urdu screener, while Control Group subjected to informal assessment.

Results: There was no significant difference in age and gender statistics between control and experimental group with $p=0.765$ and $p=0.245$ respectively, there was statistically significant difference in time of application between the two groups ($p<0.001$) assessment time of 36-40 minutes in majority and no assessment completed before 25 minutes while in the experimental group, majority of assessments were completed in 15-20- and 21-25-minutes group. Cronbach alpha value of 0.747 of Specific Aphasia Screener proved its internal consistency.

Conclusion: Specific Aphasia Screener in Urdu is simple, precise, reliable and applicable in short time to assess the language competence of patients with aphasia.

Keywords: Aphasia, Language disorder, Specific aphasia screener, Urdu.

INTRODUCTION

Aphasia is an acquired language disorder resulting from brain damage with inability to use language, including its comprehension and expression in different modalities including speech, signing and writing.[1] The term aphasia and dysphasia are used for complete and partial impairment of language ability, which is the most ideal medium for communication of intended message. Aphasia has a high local prevalence of 54.3% among stroke patients in a tertiary care institution in Lahore, Pakistan.[2] Impairment in language can cause severe problems for patient, families and ultimately can affect patients' personality. A local study by Ismail *et al.* reported quality of life to be at low level in majority of aphasia cases, with only 2% having good quality of life.[3] Language processing is done mostly in the left hemisphere with Broca's area commanding the laryngeal and oral structures through adjacent motor neurons.[4] After stroke, patient may have impairment in reception, expression or both modalities. Clinical neuroanatomical perspective is

used to categorize aphasia.[5] A substantial number of tests are available for assessment of stroke patients internationally. The three most popular are the Porch Index of Communicative Ability (PICA), with administration time of half to 2 hour's application time, Minnesota Test for Differential Diagnosis of Aphasia (MTDDA) with application time of 2-6 hours and Boston Diagnostic Aphasia Examination (BDAE) with 1-4 hours.[6] The major drawback of such evaluation batteries is the application time to complete testing procedure and hence are inappropriate to use in conditions with high case load, resulting in delayed management while the need of strong speech pathology tools for aphasia identification is still there.[7] Compared to evaluation test batteries with long application time, screeners provide quick, appropriate and simple way to assess patients. There is a dire need of aphasia screening tools in "Urdu", the national language for Pakistani people. Most of the tests being used for aphasia assessment are locally tailored, used in specific communities and are not standardized. Guo *et al.* in their study recommended that aphasia resources which suit local populations are required to comprehensively cater to the requirement of resources for aphasia management, should be developed.[8] A

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quick and short assessment scale is the need of the hour to save time by catering to more patients in limited time and save patient's resource.[9,10]

Hence, the current study was designed with the objective to develop specific aphasia screener for adults in Urdu language, as bulk of population of the country is Urdu speaking and the screener will meet the requirements of local population and also because of being a rapid test, it will save the time of clinicians in emergency and outdoor clinics, and to reach the diagnosis in less time than application of longer tests. In addition, this study has implications for research purposes since no other aphasia tool is available in Pakistani Urdu speaking population.

METHADOLOGY

The comparative cross-sectional study was conducted at Speech Therapy clinic of National Institute of Rehabilitation Sciences, Islamabad Pakistan, from November 2016 to April 2017, after obtaining approval from Institutional Research Board of Isra Institute of Rehabilitation Sciences, (Isra University vide Reg No. 1402.M. Phill-SLPHS-003). Sample size was calculated using online sample size calculator, utilizing parameters DEFF=1 and prevalence proportion of 0.031.[11]

Inclusion Criteria: Cases of either gender aged 40-70 years who were diagnosed in the Speech Therapy Clinic with aphasia were included.

Exclusion Criteria: Cases of childhood aphasia, patients in intensive care units and those having multiple neurological disorders were excluded.

To cater to any dropouts, a sample of 50 was taken and divided into 25 in Experimental and 25 in Control Groups. Study recruited a sample population of 50 adults with aphasia using consecutive sampling. The study was carried out in two phases with development of specific aphasia screener in Urdu language (SAS-U) in Phase 1 and conduction of main study by using the SAS-U, in Phase 2. SAS-U was developed, with 9 subtest/categories of questions in addition to demographic details, chosen from valid international tests including Mississippi Aphasia Screening Test (MAST),[12] Reitan–Indiana Aphasia Screening Test, Language Screening Test (LAST),[13] Aphasia Rapid Test,[14] Ullevaal Aphasia Screening Test (UAS),[15] Frenchay Aphasia Screening (FAST),[16] BDAE & PICA.[6]

An expert committee comprising of two speech therapists and a linguistic specialist went through the English aphasia screening/diagnostic tests and identified and translated appropriate and relevant items for our clinical and cultural settings and developed the SAS-U. The researcher pilot tested the SAS-U on 10 patients of both genders aged 40-70 years and different educational level, followed by revision. Final SAS-U was developed with following subtests/categories including Matching (Score 0-6), Social conversation (0-5), Naming (0-5), Auditory comprehension (0-6), categorization(0-5), Memory(0-5), Repetition(0-5, Reading comprehension (0-5) and Sentence formation(0-5). Total score for the test was 47, if a patient could not read then total score for that patient would be 42. Low scores in categories of matching, social conversation, auditory comprehension and categorization indicated Wernicke's aphasia. Low scores on social conversation, naming, sentence formation indicated Broca's aphasia. Low Scores in the categories of naming, social conversation, sentence formation indicated Anomic aphasia. Score less than 50% in all categories indicated Mixed aphasia. Scores lower than 25% in all categories indicated Global aphasia. SAS-U also categorized patients as having mild, moderate, severe and profound aphasia.

After obtaining consent of patients and maintaining confidentiality of participants, SAS-U was applied to 25 adult stroke patients in experimental group and Informal Assessment was applied to 25 stroke patients in control group. Time of application of test was noted for both groups. Scoring of SAS-U was done for all patients and degree of impairment (mild, moderate and severe impairment) and type of aphasia noted.

Following data collection, Statistical Package for the Social Sciences (SPSS) version 21. 00 was used for data analysis. Cronbach's alpha reliability analysis for the tool was applied. Quantitative variables with normal distribution were expressed as Mean±SD and qualitative variables were expressed as frequency and percentages. Chi-square test and Independent sample t-test were applied to explore the inferential statistics.

RESULTS

After development of SAS-U, it was used in 50 aphasia patients divided into two groups, 25 in Experimental Group and 25 in Control Group, which included 33(66%) males and 17(34%) females with mean age of 59.1±8.78 years. The majority of participants 26(52%) were in 51-60 years age group, and least 2(4%) were in 71-80 years age group. Gender

and age statistics did not reveal any significant difference between experimental and control group with *p*=0.765 and *p*=0.245 respectively. Aphasia types are also significantly associated (*p*=0.025) with age, as patients with Broca's aphasia are younger than other aphasia types with 12 out of 19 cases in the age group of 51-60 years and no case in 71-80 years age group. In majority of cases in the control group (n=14) assessment time was 36-40 minutes and no assessment was completed in 15-20- and 21-25-minutes time category, while majority of assessments in the experimental group were completed in the 15-20- and

21-25-minutes category (n=11). This difference was significant with *p*<0.001 (Table I & II). Mean test time of 4.56±0.768 for the control group and a much lower time of 1.68±0.690 minutes for SAS-U in the experimental group with statistically significant difference with *p*<0.001 was also noted (Table-II).

In Reliability analysis, Cronbach's Alpha coefficient value was calculated for all nine categories which revealed a value of α=0.747, suggesting that items of the scale have high internal consistency (Table-III).

Table-I: Demographic and Clinical Characteristics of the Sample Population (n=50)

Demographic & Clinical Variables		Study Groups		
Variables	Categories	Control Group (n,%)	Experimental Group (n,%)	*p*-value
Gender	Male	16(32)	17(34)	0.765
	Female	9(18)	8(16)	
Age Group (years)	40-50	2(4)	6(12)	0.245
	51-60	14(28)	12(24)	
	61-70	7(14)	7(14)	
	71-80	2(4)	0	
Time taken to screen (Minutes)	15-20	0	11(22)	0.001
	21-25	0	11(22)	
	26-30	1(2)	3(6)	
	31-35	9(18)	0	
	36-40	14(28)	0	
	41-45	1(20	0	
Diagnosis	Broca	7(14)	12(24)	0.542
	Anomic	5(10)	4(8)	
	Wernicke's	3(6)	1(2)	
	Mixed	4(8)	2(4)	
	Global	6(12)	6(12)	

Table-II: Comparison of Control and Experimental Group for Time of Test Application (n=50)

	Control Group (n=25)	Experimental Group (n=25)		95% CI		*p*-value
Variable	Mean±SD	Mean±SD	T (50)	LL	UL	
Time of Test Application	4.60±.645	1.68±.690	15.447	2.539	3.300	<0.001

(CI = Confidence Interval, LL = Lower Limit, UL = Upper Limit, M= Mean, SD= Standard Deviation)

Table-III: Descriptive and Reliability Statistics of the Specific Aphasia Screener in Urdu (n=25)

Short Aphasia Screener		Statistics
		Mean±SD
Domains	Matching	4.13 ±2.22
	Social conversation	2.30±1.06
	Naming	1.00±0.90
	Auditory comprehension	4.00±2.00
	Categorization	3.30±2.05
	Repetition	1.78±1.56
	Memory	2.00±1.65
	Reading comprehension	2.44±1.81
	Sentence formation	1.43±0.94
Total score		19.24±11.07
Cronbach's Alpha= 0.747		

Patients with different types of aphasia also perform well on SAS-U than on informal assessment procedure. Patients with Broca's aphasia took more time than other types; most likely as the whole test was applicable to them and some extra time was required to interpret their responses. Patients with global and mixed aphasia took less time because they were not able to perform related tasks in SAS-U. Both groups in the study were compatible in all respects but difference in the statistics were quite significant. Mean time of control group was 4.60±0.645 and mean time for experimental group was 1.68±0.690. Independent sample t test shows significance difference in favour of SAS-U with $p<0.001$.

DISCUSSION

Different type of rapid tests have been developed and validated in different countries , like Aphasia Rapid Test for use in acute settings and takes less than 3 minutes , the Mississippi Aphasia Screening Test (MAST),[12] Detection Test for Language Impairments in Adults and Aged (DTLA) , Language Screening Test (LAST),[17] and Frenchay Aphasia Screening Test (FAST).[18] Specific Aphasia Screener in Urdu (SAS-U) Language was developed because of essential requirement of a short aphasia screener in local language so it is easier for the aphasic patient to understand the objective of assessment, follow the instructions, with objects which are familiar and recognizable so that assessment can be accurately made in a short time compared to informal assessment. Although the present study's gender and age statistics did not reveal any significant difference between experimental and control group with $p=0.765$ and $p=0.245$ respectively, this demographic distribution is associated with factors which are present before stroke occurs and help detect the neurocognitive changes that occurred after stroke in connection with aphasia 19. Compared to SAS-U, MAST,[12] also served the purpose of quick assessment to keep the stress level of patients down during assessment and had good ability to differentiate communication impairments among clinical as well in comparison to normal individuals, however the importance of our study is that the developed SAS-U was compared with informal assessment done in stroke cases with somewhat similar demographic distribution in both groups. In similarity to our SAS-U screener, a Language Screening tool (LAST),[13] was also reported to be a simple tool for use in acutely developed stroke cases and can be applied rapidly, however it has sensitivity of 0.98 and specificity =1 compared to Boston Diagnosis Aphasia when externally validated, an internal consistency of Cronbach alpha 0.88 compared to our SAS-U which showed a Cronbach alpha value of 0.747 and a median application time of 2 minutes compared to mean of 1.68±.690 in case of SAS-U. Azeri aphasia screening test developed by Salehi *et al.* and reported in 2016 from Iran is also a screening test reported with internal consistency with Chronbach alpha value of 0.901, with 8 subscales with >0.8 intraclass correlation for the subscales, and is in use of Azeri language.[20] Language is the reflection of cultural values and conventions and is closely adhered to speech behavior of individual,[21] so it is the right of every individual to be assessed in their own language irrespective of international languages.

LIMITATIONS OF STUDY

The application of test should have been done again after some period for comparison. Sample size was limited and only involved certain population with aphasia and as such, these findings cannot be generalized to the rest of the population.

CONCLUSIONS

SAS-U is simple, precise, reliable and applicable in short time and economical to assess the language competence of Urdu speaking patients with aphasia. It has culture friendly items and can be applied on aged as well as illiterate.

Conflict of Interest: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

TY & SN: Data acquisition, critical review, approval of the final version to be published.

GS & AF: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

SM: Data analysis, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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