Development Of Language Screening Tool In Urdu (Lstu)

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ABSTRACT

Background: Issues arising in the prenatal, perinatal, and post-natal periods may result in a delay in the development of language milestones in children, affecting communication. With dearth of culturally appropriate screeners to screen these children in the Urdu language needs to be addressed.

Objective: To develop and validate a language screening tool in Urdu (LSTU) for children who are suspected of developing language disorders, for use by professionals and parents.

Methods: This exploratory study using convenience sampling was conducted at Riphah International University from 1st February to 31st July, 2023. The study was conducted in two phases. In phase 1, a tool named "Language Screener in Urdu Langu[1]age" was developed and items constructed by experts and a literature review followed by validation by 10 experts. In Phase 2 the developed tool was piloted on a sample of 120 children to analyze its reliability including Cronbach alpha and factor analysis for domain identification within the tool, using SPSS 21.

Results: The study developed a language screener in Urdu including three sub-categories according to age groups including i) birth to 6 months: 20 items, ii) 6 months to 1 year: 19 items, and iii) 1-2 years: 15 items. In addition to Face validity, the Convent validity CV/AVE index for the first and second categories was 0.89 and 0.94 for the third category. The tool has a high Cronbach alpha for the three sub-categories including α= 0.7, 0.9 and 0.966. The Exploratory Factor Analysis also revealed high values of 0.735,0 .710, 0 .799.

Conclusion: The "Language Screener in Urdu" (LSTU) is a locally developed, standardized tool with good reliability, validity, and variability for early identification and screening of children who are at risk for developing language disorders.

Keywords: Language development, Language screener, Reliability, Tool, Validity.

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INTRODUCTION
Human language comprises systematic characteristics with speech sounds combined to make words, words combined to make phrases, and phrases combined to make sentences thus making humans communicate as we as adapt their language to convey ideas, thoughts, needs and knowledge. Thus it is defined by Noam Chomsky as "a collection of words and phrases that are finite and infinite and are made up of individuals to several limited parts of phrases to have a finite length" (1). Language, specifically human language has two types and five accepts. Two types are expressive and receptive. Receptive language is getting information like words, gestures, and symbols from others. Children need more receptive language than expressive language. Expressive language is the skill in which we communicate ideas, needs through words, gestures, signs, and symbols (2).

Language development starts before birth, which guides the fetus's preference for language after birth since the fetus can hear its mother's speech throughout the final trimester which is represented with change in fetal heart rate and motor activity. Hence, from the initial few days of life, babies show a preference for the language that their mother speaks. This early awareness during fetal development creates the groundwork for postnatal language acquisition (3). The first seven months of life are referred to as the pre-linguistic stage. In this, the newborn will cry during the first two months of life to convey any distress. This is followed by cooing around two to four months, &. infants begin to play with voice between 4 and 7 months of age. The babbling stage begins at six months, in which babies use their speech organs to make sounds. They engage in vocal play and babble when they are around their parents or other caregivers. The two-word stage follows, and it usually happens when a child is one or two years old. They start to use one-word expressions at age one, and by age two, they are combining two words. Children improve their sound production abilities all through this phase, and when they reach the two-word stage, they start grasping grammar. The telegraphic period, which lasts for 24 to 30 months, comes next when kids connect words to create brief phrases. Only necessary morphemes and words with fundamental semantic significance are employed at the telegraphic stage (4)**.**

Several issues in the prenatal, perinatal, and post-natal period may result in delay in development milestones of language of children, making it difficult for children to talk until they are three or four years old, hence screening is essential. To determine who is at risk and identify problems, tools like screeners are used (5). A screening tool is defined as a questionnaire that helps to identify an early symptomatic stage of a disorder, to avoid delay in intervention including therapies (6).

The screener is used by professionals, such as nurses, teachers, trained paraprofessionals, and medical professionals, in assessing developmental delays in children. Especially primary health care providers who take care of children before going to school which not only includes family-centered, comprehensive, coordinated care but also provides them with medical care when a child is assessed at risk by a screener (6). There is a dearth of culturally appropriate valid screeners in different cultures and regions along with normative data (7).

The Urdu language is the national language of Pakistan. For around 70 million it is the first for 100 million it is 2nd language mainly in the Indo-Pakistan subcontinent (8). Urdu is quite culturally different from English. Urdu rightly represents local social customs, values & norms, and traditions (9).

Keeping in view the need for culturally appropriate valid language screeners for Urdu-speaking children current study was conducted to develop and validate a language screening tool in Urdu

for children who are suspected of developing language disorders, for use by professionals like SLPs, pediatricians, psychologists, nurses, and parents. This study will provide a valid and reliable language screening tool for children for use by professionals like SLPs, pediatricians, psychologists, nurses, and parents for identifying children who are at risk for developing language disorders.

METHODOLOGY

The study was conducted at Riphah International University Department of Rehabilitation Sciences, Islamabad from 1ˢᵗ February 2023 to 31ˢᵗ July 2023, after permission of the research ethical committee vide Ref: RCRAHS-ISB/REC/MS-SLP/01475. The language screening tool in Urdu language was developed which consisted of three sub-scales according to the age group.

The study was conducted in two phases:

Phase One: In the first phase the item generation was done through a literature review. The construction and selection of the specific test items were guided by a literature review, following the normal developmental milestone, feedback from various parents about particular age ranges and red flags that are important to language development. This phase was further divided in various steps:

Step 1: Identification of domain:
Domains were identified by keeping in view the various risk factors leading to suspected language disorders. The developmental history, prenatal, perinatal, post-natal, birth trauma, syndrome or congenital history, family history of speech and language disorder, and developmental milestones of receptive and expressive language were taken into consideration. In this research, the domain was red flags, some risk factors, and pre-speech skills that are been ignored by parents that lead to developmental language disorder.

Step2: Generation of items:
Items were generated keeping in view the literature review and with reference to the domains identified in the first step.

Step 3: Face validity and content validity.
After item generation, the screener face validity and content validity were done. For Content validity items were given to 10 experts of SLP with a minimum experience of at least 2 years, who rated each item for relevance, clarity, and simplicity, on a scale of 1-4. Two rounds of content validity were been carried out. In the first round, some items were marked as low on relevance, clarity simplicity, and ambiguity so those items were revised and some were deleted. For those revised items the second round of content validity was done and the scale was finalized. The language screener consisted of three sub-scales with reference to age group. The first subscale was from birth to 6 months which consisted of 20 items. The items that depicted normal developmental sequence were scored as zero, while those indicating red flags were given 1. A higher score indicated the need for further referral for detailed assessment. In this reverse scoring was done for 16 items. The second sub-scale with an age range of 6 months to 1 year consisted of 19 items. The third sub-scale was from the age range of 1-2 years and consisted of 15 items.

Data was entered in Excel worksheet and coded and statistical analysis was done by SPSS Version

21. Descriptive analysis was done by using frequency distribution and percentage. For internal consistency, Cronbach alpha was used and factor analysis was done for domain identification and construct validity.

Phase Two: After the content validity and calculating the CVI index, the screener was administered to a sample of 120 parents/ guardians of children aged birth to two years including 60 typical and 60 atypical children of both genders (figure 1). Data was collected from the parents who were from different areas of Rawalpindi and Islamabad and various institutions, Fuji Foundation Hospital (FFH), Creative Kinder House, and Gulberg Green Campus. For this the parents of children from birth to 2 years of age were approached. Parents were briefed about the study and were given the questionnaire.

Statistical Analysis:
Data was analyzed using SPSS version 21. Cronbach's alpha, content validity, and factor analysis were performed for the three categories of the scale.

Figure 1: Tool Development Flow diagram
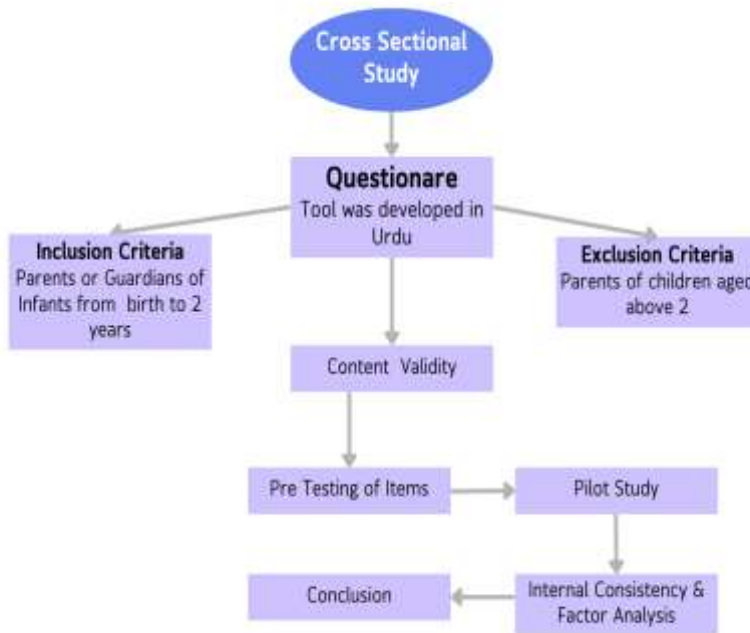
RESULTS

The sample for reliability testing of the scale comprised an equal number of typical and atypical children and different age group categories, with 57.5% males and 95.83% parents educated (table 1).

Table 1: Demographic Characteristics of Sample Population (n=120)

Variable	Category	N	%
Group	Typical	60	50
	Atypical	60	50

Age Group	≤ 6 Months	40	33.33
	> 6 Month- ≤1 year	40	33.33
	>1 year to 2 Year	40	33.33
Gender	Male	69	57.5
	Female	51	42.5
Parent Education	yes	115	95.8
	No	5	4.2
Mother Education	Primary	7	5.8
	Matric or Intermediate	24	20
	Other	89	74.2
Father education	Primary	9	7.5
	Matric or Intermediate	17	14.2
	Other	94	78.3

The tool revealed good content validly of the three subscales. For the 20-item subscale of age group birth to six months the S- CVI/AVE was 0.89. For the 19-item subscale six months to 1 year the S- CVI was 0.89 and for the third 15-item subscale for age range 1- 2 years the S-CVI was 0.94.

Phase Reliability Testing of Urdu Language Screener:
The study revealed good reliability of the three subscales (table 2).

Table 2: Reliability of Language Screening Urdu tool

Age Category	Cronbach alpha value	Number of items
Birth - 6 months	.730	20
6 months - 1 year	.904	19
1 year - 2 year	.916	15

Kaiser-Meyer-Olkin (KMO) test revealed a value of > 0.7 indicting that the sample for the study is adequate and with significant correlation among variables indicated by Bartlett's test of sphericity (table 3) indicting adequacy for factor analysis (table 3).

### Table 3: Kaiser-Meyer-Olkin & Bartlett's Test Statistics

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	Birth – 6 Months	0.735
	6 Months – 1 Years	0.71
	1 - 2 Years	0.799
Bartlett's Test of Sphericity	Approx. Chi-Square: Birth – 6 Months	475.299
	df	190
	Sig	0
	Approx. Chi-Square: 6 Months – 1 Year	401.451
	df	171
	Sig	0
	Approx. Chi-Square:	333.068

	1 Year- 2 Years	
	df	105
	Sig	0

For every sub-scale, the factor analysis was done to determine the domains within the scales. For the sub-scale of age range Birth to six months and 6 months to 1 year there were 5 components which are also endorsed by the Component Matrix table & Initial Eigenvalues, Extraction Sums of Squared Loadings, and Rotation Sums of Squared Loadings showed the 5 components. Initial eigenvalues have a cutoff score of 1, if the value is less than 1 then it shows that there are no items in those components. The screen plot also gives evidence about the components. The dip is shown at number 5 on the x-axis, which proves that there are 5 components (figure 1a & 1b)

For the sub-scale 1 to 2 years, there were 3 components, which is further endorsed by the Rotated Component Matrix which also shows three components and the items included in them. The screen plot also gives evidence about the components. The dip is shown at number 3 on x-axis, which proves that there are 3 components (figure 1c).

Figure 1: Scree Plot for the three subscales.
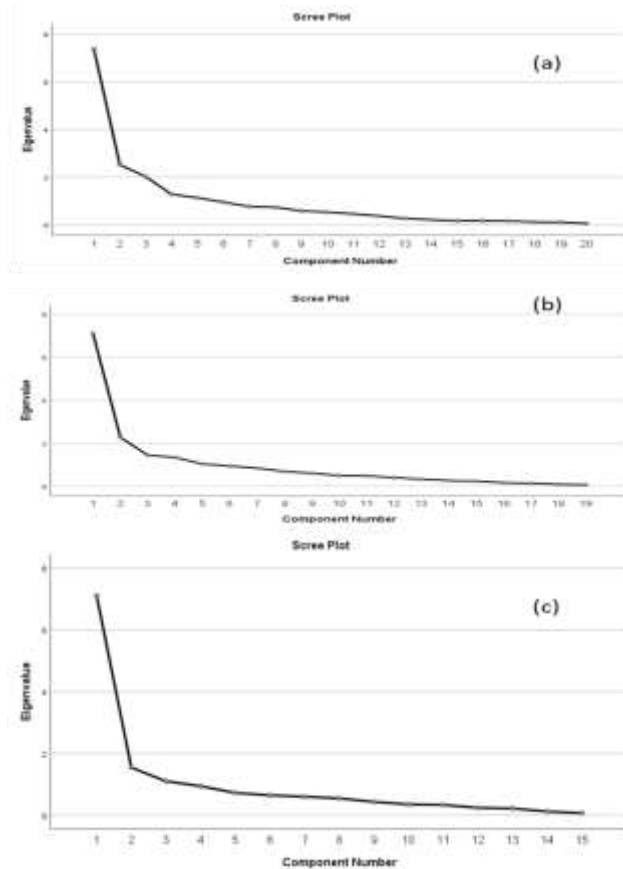
DISCUSSION

The current study developed and validated a language screening tool in Urdu for children aged birth to 2 years, who are suspected of developing language disorders, for use by nurses, teachers, trained paraprofessionals, and medical professionals so they can be provided medical care (10). Keeping in view the importance of the psychometric properties of a tool (11), the current study while developing the tool with three sub-divisions assessed the internal consistency, and validity and also performed factor analysis.

The 3 subdivisions of the developed tool are according to the child's age group. The developed tool is highly reliable with Cronbach's alpha value of .73 for the 20-item subscale for the age group from birth to 6 months, .904 for the 19-item subscale for the age group 6 months-1years and .916 for 15 item subscale for the age group >1 to 2years. Results from exploratory factor analysis also supported the construct of scales. Similarly, another local study involving the development of a Receptive Language scale in the Urdu language for 0-6-year-old children revealed an internal consistency of α= 0.948 (12). In contrast, a study by Pathak & Sovani-Kelkar conducted in India involving a sample of parents of 100 babies aged 6 months to 18 months, developed a screening tool for babies at risk of having language delay and reported internal consistency of α=.0.457 to 0.853, (13) and a study to determine psycho metrics of a pediatric speech-language screening test called RALF developed in Portuguese which utilized a sample of 2020 3-5 years old kids revealed internal consistency of 0.7, 0.8 and 0.7 with great inter-judge reliability of 0.951 (14) which are quite lower compared to current study While a Swedish study involving a sample of 328, 4-year-old children including 23% multilingual, developed a language screening tool with a high internal consistency of .84 to .96 (15). While the current study's sample involved birth to 2 years children. Another study conducted for Portugues speech-language screening test revealed great inter-judge reliability (0.951) and acceptable internal consistency of ≥0.7 (16). While a Communication and language assessment questionnaire for Multiple sclerosis (CLAMS). through online surveys involving 41 items. An initial psychometric assessment has been carried out on the items, featuring internal consistency, principal component analysis, test-retest reliability, criterion validity, and floor/ceiling effects analysis. To assess the criterion validity, the Communication Participation Item Bank (CPIB) and the CLAMS were compared. The final version of CALMS with 11 items revealed internal consistencies of items of 0.944, and the correlation coefficient value was ≥ 0.70. indicating that it was a reliable tool (17).

A Bangladeshi study by Hamadani JD et al., which assessed the reliability and validity of mothers' report of language development for 1-year children reported high short and long-term reliability of 0.50 (18).

A study by Lousada & Valente, to determine psychometric characteristics of Portuguese speech-language screening test utilized a sample of 202 birth to 11-year-old children and revealed a high content validity (16), similarly, the current study revealed an S-CVI of .94. and another local study involving the development of a receptive language scale in Urdu revealed a content validity of 1 for every item and for the scale (12).

CONCLUSIONS

The "Language Screener Tool in Urdu" (LSTU) is a locally developed, standardized tool with good reliability, validity, and variability for early identification and screening of children who are at risk for developing language disorders.

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