

# Cross-cultural adaptation and validation of the Liebowitz Social Anxiety Scale (LSAS-SR) Tamil Version

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(Index words: social phobia, social anxiety disorder, screening tools, prevalence, sensitivity and specificity)

## Abstract

**Background:** Despite being the third most prevalent psychiatric disorder, social anxiety disorder remains under-diagnosed due to multiple reasons. Although many screening instruments are available in the English language, to date no instrument has been translated into Tamil.

**Objective:** To translate and validate the Liebowitz Social Anxiety Scale (LSAS-SR) into Tamil among a group of Sri Lankan university students whose mother tongue is Tamil.

**Method:** The process of translation and validation involved standard procedures. DSM-5 was used as the gold standard to diagnose social anxiety disorder. As part of the psychometric study, test-retest reliability and analysis of items for internal consistency of the instrument were assessed.

**Results:** A cut off of 55.5 had the optimum sensitivity and specificity for the Tamil version of the LSAS-SR. The Cronbach's alpha between the avoidance subscale, total and the fear subscale total was 0.860 while the figures for Cronbach's alpha between the total score and fear subscale total score and the avoidance subscale total score were 0.880 and 0.855, respectively. The test-retest reliability correlation coefficients for the fear subscale, avoidance subscale and the total score were 0.890, 0.925 and 0.918, respectively ( $p < 0.001$  for all).

**Conclusions:** The cut off score of 55.5 had the optimum sensitivity and specificity for the LSAS-SR Tamil version. It had good internal consistency and test-retest reliability. Further studies will enable the assessment of the prevalence of social phobia and investigation of cultural and environmental factors associated with social phobia in Sri Lanka.

## Background

The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) describes social anxiety disorder (SAD), also known as social phobia, as persistent, intense fear or anxiety about specific social situations where the person believes he/she may be judged negatively, embarrassed or humiliated leading to avoidance of anxiety-producing social situations or enduring them with intense fear or anxiety [1]. Social phobia is reported to be the third most common psychiatric disorder with a lifetime prevalence of 7-13% [2, 3]. Social phobia has a very early onset, with many of the sufferers developing it in late childhood or early adolescence [4]. It has also been reported to be a direct or indirect risk factor for the development of other mental disorders such as depression and substance dependence [5]. If untreated, social phobia has been found to run a chronic and unremitting course with significant academic, occupational and relationship consequences [6].

The Liebowitz social anxiety scale-clinician rated version (LSAS-CA) has been described as one of the best psychometrically validated scales for social phobia [7, 8]. However, the administration of LSAS-CA was found to be costly [9] which resulted in the development of the LSAS self-rated version (LSAS-SR). LSAS-SR appears to have satisfactory psychometric properties as the clinician-administrated version [10]. The English version of the LSAS-SR consists of two subscales of 24 items on fear and avoidance scored on a four-point Likert-type scale which evaluates symptoms experienced in the week prior to its administration. LSAS-SR has been adapted and validated into several languages including French [11], Hebrew [12], Turkish [13] and Sinhala [14].

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Tamil is the first language of the Tamil ethnic group and the majority of Moors living in Sri Lanka [15]. It is also reported to be spoken by about 5.9% of the population of India and Tamil migrants of Sri Lanka and Indian origin living in other countries [16]. To the best of our knowledge there are no translated and/or validated screening tools in Tamil to screen or assess social phobia or published data on the prevalence and impact of SAD among the Tamil speaking population of Sri Lanka or the rest of the world. Considering the lack of trained personnel to administer complex diagnostic criteria in a resource scarce country such as Sri Lanka, it is essential that screening tools are made available, especially for ethnic minorities where the first language of the psychiatrist, in most cases, may not be Tamil. Further, even though the Sinhalese and Tamil cultures share certain values, there is no information regarding how cultural values may influence the perceptions of symptoms of mental illnesses among the various ethnic groups in Sri Lanka. Therefore, it is important to identify, translate and culturally validate an instrument for screening for social phobia in Tamil.

Our aim was to translate, culturally adapt and validate the (LSAS-SR) in Tamil in a group of Sri Lankan University students whose first language is Tamil.

## Methodology

The study was conducted among students of two state universities of Sri Lanka (i.e., the University of Kelaniya and the Eastern University of Sri Lanka) following approval of the Ethics Review Committees of the Faculty of Medicine, University of Kelaniya (P/242/12/2019) and the Eastern University of Sri Lanka (E/2020/01). Participants were provided a written brief introduction to the study and those who were willing to participate were requested for written informed consent.

The LSAS-SR was translated to Tamil and that was back-translated to English according to standard technical guidelines by independent bilingual consultant psychiatrists. Face validity and cultural acceptability of the translation was established using the Delphi technique among a panel of experts in psychiatry who were also bilingual. This version was pilot tested among a group of consenting participants and suggestions provided by the participants were presented to the same panel. The final approved version was pilot tested among a group of university students; there were no major issues pointed out by the participants in filling the tool.

## Sample size

As per Sheatsley *et al*, 25 participants were recruited for the pilot testing [17]. Sample size calculation for the translation and validation of LSAS-SR was done using the rule of thumb suggested by Bentler *et al*. to have 5 to 10 participants per item [18]. Five (5) participants per item

were recruited. A further 10% was added to overcome the non-response and therefore the required sample size needed for the validation phase was 133. Forty five students were required to calculate test retest reliability as per the above.

Recruitment to the study was through notices on the internet, notice boards and social media. Participants willing to provide written informed consent other than those who participated in the pre-testing were requested to fill out the Tamil LSAS-SR. An independent interview of the participants using the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5) was conducted by a bilingual Tamil speaking consultant psychiatrist who was blind to the scores of the LSAS Tamil version [1]. The DSM-5 criteria were considered as the gold standard to diagnose social anxiety disorder.

A random sample of 75 participants who filled the LSAS-SR Tamil translation were invited to fill it again after two weeks by an investigator blind to the initial results of the LSAS-SR Tamil version.

Data were analysed using SPSS software. DSM-5 diagnostic criteria were used as the gold standard to diagnose SAD and to assess criterion validity. The best cut-off score for screening social anxiety disorder was determined using the receiver operation characteristics (ROC) curves between the DSM-5 and the LSAS-SR scores and evaluating the sensitivity and specificity at those cut-off scores.

Internal consistency between the total score and the avoidance and the fear subscales, as well as the fear and avoidance subscales were assessed using Cronbach's alpha. Pearson's correlation coefficient was used to assess test-retest reliability.

## Results

A total of 203 students, both male and female, from the Faculty of Medicine, University of Kelaniya and the Eastern University of Sri Lanka consented to participate in the study (Table 1). All the participants were 20-25 years of age; 60.6% were female and 54.2% were first and second year students (Table 1).

As per the DSM-5 criteria, the prevalence of social phobia was 23.15% among the whole population with a prevalence of 23.5% among female students and 22.5% among male students.

The area under the receiver operator characteristics curve when the LSAS-SR Tamil scale's values were compared with that of the gold standard (DSM-5) was 0.84 (95% CI: 0.742-0.884) (Figure 1).

Table 2 gives the sensitivities and specificities of the tool for different cut-off values. A total score of 55.5 provided the best balance between sensitivity (76.6%) and specificity (74.4%). The false positive rate was 25.60% and the positive predictive value was 74.95%.

The internal reliability when calculated using the Cronbach's alpha for the avoidance subscale (Table 3), fear subscale (Table 4) and the total scores were 0.954, 0.958 and 0.904, respectively.

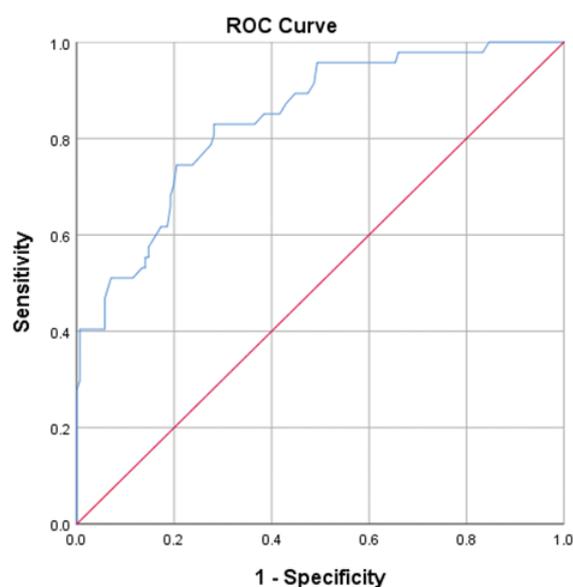
The Pearson's correlation coefficient for test re-test reliability for the fear and avoidance subscales and the total score were 0.890, 0.925, 0.918 respectively.

**Table 1. Profile of participants**

<i>Variable</i>	<i>Number (%)</i>	<i>Prevalence of social phobia based on DSM-5 criteria N (%)</i>
<b>Gender</b>		
Male	80 (39.4)	18 (22.5%)
Female	123 (60.6)	29 (23.5%)
<b>Year of study</b>		
1	56 (27.6)	8 (14.28%)
2	54 (26.6)	4 (7.40%)
3	23 (11.3)	3 (13.04%)
4	32 (15.8)	18 (56.25%)
5	38 (18.7)	14 (36.84%)

**Table 2. Sensitivity and specificity of LSAS-Tamil version using DSM-5 as the gold standard**

<i>LSAS-Tamil version score</i>	<i>Sensitivity</i>	<i>Specificity</i>
50.50	.830	.705
51.50	.830	.712
52.50	.830	.718
53.50	.809	.718
54.50	.787	.724
55.50	.766	.744
56.50	.745	.763
57.50	.745	.769
59.00	.745	.782
60.50	.745	.795



**Figure 1. Receiver Operator Characteristics curve for the LSAS-Tamil version using DSM-5 criteria for SAD as the gold standard (area under the curve 0.84 (95 CI: 0.742-0.884)).**

**Table 3. Cronbach's alpha values for avoidance subscale**

	<i>Scale mean if item deleted</i>	<i>Scale variance if item deleted</i>	<i>Corrected item-total correlation</i>	<i>Squared multiple correlation</i>	<i>Cronbach's alpha if item deleted</i>
a1	24.03	275.596	.723	.743	.952
a2	24.07	276.822	.650	.653	.952
a3	23.98	273.057	.711	.705	.952
a4	23.84	269.257	.675	.636	.952
a5	23.88	273.576	.753	.703	.951
a6	23.45	277.307	.595	.564	.953
a7	23.69	273.753	.697	.588	.952
a8	23.94	276.174	.701	.634	.952
a9	24.24	280.948	.566	.567	.953
a10	23.95	273.354	.743	.743	.951
a11	23.76	268.288	.812	.816	.950
a12	23.72	269.271	.771	.785	.951
a13	23.64	267.762	.747	.721	.951
a14	23.40	271.486	.669	.671	.952
a15	23.74	272.547	.796	.715	.951
a16	23.35	280.963	.391	.565	.956
a17	24.27	283.296	.492	.539	.954
a18	23.94	276.059	.705	.690	.952
a19	23.71	266.959	.764	.753	.951
a20	23.63	283.334	.396	.512	.955
a21	23.62	267.671	.712	.662	.952
a22	24.01	274.215	.683	.633	.952
a23	24.14	275.039	.743	.691	.951
a24	23.90	277.168	.583	.507	.953

**Table 4. Cronbach's alpha values for the fear subscale**

	<i>Scale mean if item deleted</i>	<i>Scale variance if item deleted</i>	<i>Corrected item-total correlation</i>	<i>Squared multiple correlation</i>	<i>Cronbach's alpha if item deleted</i>
f1	26.95	286.650	.641	.742	.956
f2	26.81	286.601	.659	.711	.956
f3	26.82	284.384	.653	.740	.956
f4	26.74	283.076	.595	.702	.957
f5	26.41	287.684	.676	.617	.956
f6	26.04	291.221	.507	.507	.958
f7	26.36	284.562	.708	.597	.956
f8	26.49	289.080	.593	.570	.957
f9	26.75	286.210	.673	.713	.956
f10	26.57	284.309	.776	.733	.955
f11	26.47	282.074	.805	.815	.955
f12	26.50	283.412	.720	.735	.956
f13	26.42	280.597	.705	.651	.956
f14	26.13	280.900	.657	.678	.956
f15	26.29	281.782	.732	.710	.955
f16	25.95	290.003	.484	.565	.958
f17	26.45	284.747	.678	.594	.956
f18	26.53	280.955	.783	.727	.955
f19	26.37	275.415	.767	.758	.955
f20	26.23	284.508	.618	.660	.957
f21	26.32	278.954	.687	.741	.956
f22	26.64	281.754	.747	.684	.955
f23	26.76	280.433	.785	.738	.955
f24	26.71	280.561	.803	.746	.955

## Discussion

Our sample consisted of students whose mother tongue was Tamil and attending two state universities in Sri Lanka. Out of 203 participants 123 (60.6%) were female and all were in the age group of 20-25 years.

The Tamil version of LSAS-SR demonstrated adequate test-retest reliability and adequate internal consistency for the fear and avoidance subscales, and the total score.

The cut off score of 55.5 for the LSAS-SR Tamil version gives the optimal sensitivity and specificity for social phobia. 23.15% of the students in this study group have social phobia according to DSM-5 criteria. The prevalence figures we found in the current study appears to be much higher than that from a study done among Sinhala speaking university students in Sri Lanka which reported a prevalence of 13.3% [14]. The difference may be explained by ingrained socio- cultural practices and beliefs among various ethnic groups in Sri Lanka [19, 20]. Two Indian studies conducted among university students reported figures of 19.5% and 25% which are similar to findings of this study [21, 22].

With the de-centralization efforts of psychiatric services of Sri Lanka, there is now a wider availability of board-certified psychiatrists in areas where the majority of the population is Tamil speaking, especially in the Northern and Eastern provinces than a decade ago. However, their services are mostly limited to tertiary- and secondary-care health institutions. By making translated and validated scales freely available in native languages especially in the above areas would facilitate to reduce the gap in services and hence the service provision. Considering the relatively high prevalence of social phobia as mentioned above in Tamil speaking young people, the scale could be made available to be used in the general practice settings, secondary schools, etc in these areas and arrange referral pathways for those who score above the cut off limits.

## Limitations

The LSAS-SR Tamil version was validated only among university students therefore the scores may vary if conducted among non- university attending people of the same age group or the general public

## Strengths

To the best of our knowledge this is the first scale translated and validated in any Tamil speaking population in the world.

## Conclusion

The cut off score of 55.5 in the Tamil version of LSAS-SR had a sensitivity and specificity of around 75% among our study population of university students. Island wide

studies are recommended among other groups of people using the translated and validated LSAS-SR- Tamil version to study its generalizability among other groups of people and to look into the prevalence of social anxiety disorder and its risk factors in Sri Lanka.

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## Author contributions

AH and ARW wrote the proposal AH, IP, TT and GT collected the data and conducted the diagnostic interviews. AH, IP and ARW analysed the data. AH, IP, ARW, TT and GT contributed to the writing of the manuscript. All authors reviewed and approved the final manuscript.

## Conflict of interest

None.

## Ethical standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

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