



# The Liebowitz Social Anxiety Scale (LSAS): Psychometric Properties of the Amharic Version in Ethiopian University Student Sample

Aman Sado Elemo<sup>1</sup> · Ayşe Sibel Türküm<sup>2</sup>

Accepted: 15 December 2020 / Published online: 5 February 2021

© The Author(s), under exclusive licence to Springer Science+Business Media, LLC part of Springer Nature 2021

## Abstract

The Liebowitz Social Anxiety Scale (LSAS) assesses the fear and avoidance associated with social anxiety and has been validated in several languages. The present study describes the adaptation and psychometric evaluation of the Amharic version of the LSAS in Ethiopian university student samples. Two studies were carried out. In the first study, 429 participants completed a survey, including demographic information, and the Amharic version of the LSAS. In the second study, 32 participants completed a survey comprising demographic information and the Amharic version of the LSAS. The participants were recruited using a convenience sampling method. The findings suggest a two-factor solution (CFI = 0.92, TLI = 0.92, and RMSEA = 0.06) consistent with the original factor structure and excellent reliability coefficient. Finally, the Amharic version of the LSAS can demonstrate good sensitivity to treatments (solution-focused and social skills training groups) in a nonclinical sample of university students in Ethiopia. Taken together, the present findings indicate that the LSAS is a suitable psychometric measure to assess social anxiety in Ethiopia.

**Keywords** Ethiopia · Liebowitz Social Anxiety Scale · Psychometrics · Scale adaptation · Social anxiety

After leaving high school, students enter universities with excitement, great expectation, and optimism. They may also encounter considerable adjustment-related challenges given that they leave their long-established social support groups behind and step into a new university life. This new life can be a distinguishing opportunity for youngsters to change their social support network, grow intellectually, and address developmental related concerns. However, successfully addressing adjustment and developmental concerns can facilitate growth, given that

---

✉ Aman Sado Elemo  
aselemo@gelisim.edu.tr

<sup>1</sup> Istanbul Gelisim University, Istanbul Turkey

<sup>2</sup> Anadolu University, Eskişehir Turkey

students feel competent in their behavior, autonomous in their choices, and experience relatedness in their interpersonal relations (Deci and Ryan 2002; Ryan and Deci 2017, Carmona-Halty et al. 2019). However, in a cultural context, where expressing feelings and openly addressing opinion are less favored, individuals may more likely become self-conscious and suspicious about their ability.

Diverse cultures prepare youngsters for new developmental roles in widely varied and changing forms. In certain cultures, youths are encouraged and expected to carry out self-regulated actions to achieve personally significant objectives. However, in other cultures (for instance, Ethiopia), children grow up in a family atmosphere where they have little say in the decision-making processes (Seleshi and Sentayehu 1998). There would be limited opportunities for individuals to express feelings and make autonomous decisions that might help reveal their talents and realize their potential. In such cultures, sustaining group harmony and gaining social approval become the focus. Therefore, university students would be less likely to be encouraged to try out new initiatives and take serious responsibilities in the future.

Meeting new people, carrying out daily academic tasks, forming interpersonal relationships, and succeeding in different expectations from peers, family, and faculty can be among the areas of challenge to many undergraduate students (Dyson and Renk 2006). While attempting to adjust to the new social settings, students may demand skills to maintain independence and self-sufficiency (Bowman 2010). Moreover, as university life involves competitive and stressful experiences for young people (Dyson and Renk 2006), such competitiveness and the multitude of social evaluative concerns during undergraduate years may heighten susceptibility to a real or imagined fear of embarrassment (Russell and Topham 2012). Possible inability to meet expectations and/or developmental needs in valued areas of life may enhance susceptibility to mental health concerns, such as social anxiety disorder.

Social anxiety can be associated with ‘a strong desire to convey a particular favorable impression of oneself to others and marked insecurity about one’s ability to do so’ (Clark and Wells 1995, p. 69). Doubting an ability to impress others may create a substantial risk of behaving in an incompetent and undesirable fashion with its consequences of a loss of status or rejection (Gilboa-Schechtman et al. 2000). An increased apprehension by individuals about their roles, status, and behavior may pave the way to a persistently advancing fear, impacting significant distress and impairment in their daily functioning. Social anxiety, despite it being among the most prevalent of mental health concerns, may not be easily identified or treated in an increasing number of individuals (Chavira et al. 2004). Therefore, the possibilities of experiencing high levels of distress and impairment in the functionality of an individual can be explained by intense social anxiety.

Research suggests that people with social anxiety lack social skills and participate less in social activities and choose professions that require low social interaction compared to peers with mild social anxiety (Beidel et al. 2010). In addition to being less likely to notice the positives in social and performance situations, tendencies to become overly self-conscious, assessing social skills as inadequate, and exaggerating the negative consequences of social encounters could be among the features of individuals intensely experiencing social anxiety (Hofmann 2007). Therefore, experiencing social anxiety, especially during the undergraduate years which is a time of growth, learning, and exploration, could limit the ability of students to make use of available opportunities and to realize their potential.

Overcoming the effects of social anxiety partly needs understanding the nature of social anxiety, its prevalence, and how it may interact with specific culture in context. However, in Ethiopia, there is a lack of valid and reliable tools for the collection of data on the prevalence of

social anxiety (Dessie et al. 2013). Therefore, it is necessary to develop or adapt psychometrically sound measures of social anxiety, so that better understanding and better assessment of the outcome measure can be performed.

Ethiopia, with its history of traditional health beliefs and practices, (Monteiro and Balogun 2013) is among the few oldest uncolonized sources of African culture (Abbink 1997). It borders Djibouti, Eritrea, Kenya, Somalia, South Sudan, and Sudan. It is situated in a war-torn region of the world, with regular political unrest and refugee crisis. Its population is 110 million, making it the second most populous country in Africa after Nigeria (UNESCO Institute of Statistics 2018). In the country, there are forty-four public universities in the country with around ten million students attending tertiary education. The majority of these students leave their families and friends to attend university education. Joining a new life at university may offer them the opportunity to discover their emotions, establish relationships with others, enhance their intellectual development, and integrate their identity and practice autonomous decision-making. In addition, the developmental and adjustment challenges university life presents to undergraduate students may also jeopardize their well-being and functionality in various parts of life.

Review of the few available studies shows the prevalence of mental health concerns in university students in Ethiopia (Dessie et al. 2013; Haile et al. 2017; Abebe et al. 2018; Tesfahunegn and Gebremariam 2019; Dachew et al. 2019). Being female or a freshman student, having relationship problems or lack of social support, and family history in psychological distress predict psychological distress (Tsefahunegn and Gebremariam 2019). However, another study reports the less likelihood of seeking professional treatment (Gebreegziabher et al. 2019), suicidal ideation, low social support, and substance use (Dachew et al. 2019) in university students.

Despite the recognition of social anxiety, as one of the most prevalent mental health concerns, there is a lack of empirical research studies in relation to social anxiety in an Ethiopian university students' context. A dearth in empirical research is attributed to a lack of culturally validated psychological outcome measures and a lack of well-trained professionals to determine the prevalence of mental health problems, such as social anxiety in Ethiopia (Wondie 2014). Therefore, the present study is aimed at adapting and assessing the self-report Liebowitz Social Anxiety Scale (LSAS), originally developed by Michael Liebowitz (1987). The LSAS has a cross-cultural adaptability record and a detailed nature to assess anxiety and avoidance in specific social and performance situations. It has been validated in different cultural contexts, including Turkish (Soykan et al. 2003), French (Yao et al. 1999), Brazilian (Dos Santos et al. 2013), Spanish (Bobes et al. 1999), and Portuguese (Terra et al. 2006). Moreover, it is a commonly used instrument to measure the severity of social anxiety symptoms and the effects of treatment outcomes (Oakman et al. 2003; Baker et al. 2002). Therefore, translating, adapting, and validating the LSAS could be valuable for an understanding of the prevalence of social anxiety in an Ethiopian university student context, test the efficiency of psychological intervention, and engage in cross-cultural research.

## Method

### Adaptation of the LSAS to the Amharic Version

The process of validating the LSAS involved translation and adaptation of the scale into Amharic. Three experts volunteered to assess and comment on the validation process of the

scale. Before starting the translation, written permission was obtained from the author, Dr. Michael R. Liebowitz. The adaptation process (translation and back translation) was carried out using the parallel blind technique (Behling and Law 2000). An independent and bilingual postgraduate student, majoring in Journalism, and a doctoral candidate in Social Work volunteered to translate the instruments from the source language (English) to the target language (Amharic). The translated versions were synthesized and understandability and appropriateness of the translations were reviewed. Moreover, the translated versions were checked in terms of the semantic, idiomatic, and conceptual equivalences of the items (Borsa et al. 2012). Meanings, grammatical errors, and equivalences in the expressions of the items (without changing the cultural meaning) were checked to ensure that the translated versions address the same aspects as the original scale.

Two bilingual doctoral candidates, one in the programs of *Educational Psychology* and the other in *Special Needs Education*, volunteered to back translate the translated version. This was conducted to assess the semantic, idiomatic, and contextual equivalences of the items in the measures. After discussion with the experts, possible ambiguities and discrepancies between the translations were resolved. Expert comments were also obtained from *Amharic Language, Counseling Psychology, and Psychological Measurement and Evaluation*, respectively. These expert comments were required on the cultural relevance, and conceptual and technical clarity of the items. After considering the views of the experts, the Amharic version of the LSAS (the LSAS-Amh Scale) was made ready for piloting. Understandability of the items and clarity of the instructions were checked by piloting the measure with two Ethiopian international students studying in Turkey. It was noted that the LSAS-Amh took approximately ten minutes. The items were further checked in terms of their understandability and made ready for the validation study.

## Participants

The participants were undergraduate students who anonymously and voluntarily participated in the study. There were two studies undertaken. The participants were included in studies based on convenience sampling. Being at least 18 years of age and Amharic speaking were among the eligibility criteria to participate in the studies. The first study was conducted to assess the construct validity and internal consistency of the LSAS-Amh scale with 429 undergraduate students. The ages of the participants ranged from 18 to 26 ( $M=21.75$ ,  $SD=1.67$ ), and 32% ( $N=140$ ) were female. There were 20.5% Freshman, 30% Sophomore, 17% Junior, and 31.5% Senior level students who were studying at Adama Science and Technology University and Debre Tabor University (Table 1).

The second study was undertaken to assess the treatment sensitivity of the scale with 32 participants. Participants of this second study were from Hawassa University, Wondo Genet College of Forestry and Natural Resources, located in Southern Ethiopia. Their ages ranged between 19 and 24 ( $M=20.88$ ,  $SD=1.36$ ), and 44% ( $N=14$ ) were female. Of these participants, 15.6% were Freshman, 50% were Sophomore, and 34.4% were Junior level students.

## Ethics

The study was conducted as part of doctoral research work. Ethical approval of the study was obtained from Anadolu University. Participants were informed about the purpose and confidentiality of the study. They were also free to withdraw from the study at any time or to refuse

**Table 1** Demographic characteristics of the participants of the studies

Variables	Study 1		Study 2	
	<i>N</i>	Percentage	<i>N</i>	Percentage
Sample size	429		32	
Age, <i>M</i> ( <i>SD</i> )	21.75 (1.67)		20.88 (1.36)	
Gender				
Male	289	67.4	18	56.2
Female	140	32.6	14	43.8
University				
Adama Science and Technology	183	42.7		
Debre Tabor University	246	57.3		
Hawassa University			32	
Seniority of study at university				
Freshman	88	20.5	5	15.6
Sophomore	134	30	16	50
Junior	75	17	11	34.4
Senior	135	31.5		

*M* mean, *SD* standard deviation

to provide responses. Their participation in the studies was anonymous and voluntary. Informed consent was obtained from all participants. Overall, the study procedures follow the guidelines regarding the ethical considerations indicated in the Helsinki Declaration of 1975, as revised in 2000. During the data collection, the necessary permission was obtained from the respective universities and authorizations. Data collection and analyses of both studies (*study 1* and *study 2*) were completed consecutively over one and a half years.

### Liebowitz Social Anxiety Scale

The original two-factor structure of the LSAS used to measure fear/anxiety and avoidance was a clinician-administered measure (Liebowitz 1987). Cognizant of its psychometric utility, studies have also examined the self-report version of the LSAS (Cox et al. 1998; Fresco et al. 2001; Baker et al. 2002). There are also studies that challenge the original factor structure as it does not show a good fit, resulting in different three-factor structures (Levin et al. 2002), four-factor structures (Safren et al. 1999), and five-factor structures (Baker et al. 2002). The three-factor structures are the group performance/interaction, the dyadic interaction, and the public activities. The four factor-structures are social interaction, public speaking, observation by others, and eating/drinking in public. The five-factor structures are social interaction anxiety, nonverbal performance anxiety, ingestion anxiety, public performance anxiety, and assertiveness anxiety. The presence of various factor structures may contribute to confusion in relation to which factor structure to rely on while adapting and validating the instrument in new cultural contexts. Therefore, in this study, the original two-factor structure is considered.

The original two-factor structure of the LSAS gives seven scores. First, the total score for the measure of social anxiety is obtained by summing up all 48 responses, ranging between 0 and 144. Second, fear ratings and avoidance ratings for both social and performance situations are summed to form a fear subscale and an avoidance subscale, respectively. The scores for each of the fear and avoidance subscales range between 0 and 72. Additionally, responses to the eleven social interaction and thirteen performance situations may be summed up separately

for fear and avoidance by creating four subscales: social interaction fear, social interaction avoidance, performance fear, and performance avoidance.

This study investigates the internal consistency and construct validity of the Amharic version of the Liebowitz Social Anxiety Scale. In order to collect data, demographic questionnaires and LSAS-Amh were administered. The demographic questionnaire was administered together with the LSAS-Amh. The LSAS-Amh is designed to assess the range of twenty-four social and performance situations that individuals use to rate their level of fear (0 = none to 3 = severe) and avoidance (0 = none to 3 = usually). It includes items such as, ‘Talking to people in authority’ and ‘Resisting high pressure salesperson.’ There is no reverse-coded item in the scale. An increase in the total score is interpreted as an increase in levels of social anxiety.

## Data Analysis

Preliminary analyses involved the examination of the demographic characteristics of the study sample. Skewness (the accumulation of cases in the tail of the distribution) and kurtosis (the tendency for cases to accumulate in the center of the distribution) were examined with the indices suggesting that the distribution is normal and that parametric statistics may be properly applied to the data. There were no significant differences between male and female participants in their levels of total social anxiety and the avoidance subscale score. A one-way analysis of covariance was performed, which revealed [ $F(1, 220) = 6.74, p = 0.01$ ] significant differences between male ( $M = 35, SD = 12.7$ ) and female ( $M = 38.4, SD = 11.7$ ) participants in their anxiety (fear) levels, indicating that the mean score of the female participants is relatively higher compared to the anxiety levels of the male participants.

The data was analyzed using SPSS Version 21.0, Lisrel 9.1, and AMOS Version 21.0. Three confirmatory factor analyses compared the three models’ goodness-of-fit to the participants’ collective response patterns using Chi-square, the comparative fit index (CFI), Tucker–Lewis index (TLI), and root mean-square error of approximation (RMSEA). As recommended by Hu and Bentler (1998), a good fit is considered when  $RMSEA \leq 0.06$  and CFI and TLI  $\geq 0.90$ .

## Results

### Analysis of the Items

The Amharic version of the LSAS scale items, item means, standard deviation, and item-rest correlations are presented in Table 2. Based on the data in Table 2, the items with the higher mean scores in the fear subscale are item five (mean = 1.72), item 16 (mean = 1.72), item 15 (mean = 1.74), and item 20 (mean = 1.74). These items were fear of talking to authority, speaking up in a meeting, being the center of attention, and giving a report to a group, respectively. The items with the lowest mean scores in the fear subscale were item 9 (mean = 1.20) and item 4 (mean = 1.29). These items were fear of writing while being observed and drinking with others in public places, respectively.

The items with the highest mean score in the avoidance subscale were item 13 (mean = 1.56), item 15 (mean = 1.56), and item 20 (mean = 1.57). These items were avoidance of urinating in a public bathroom, being the center of attention, and giving a report (presentation)

to a group. The item with lowest scores in the avoidance subscale was item 2 (mean = 1.28). This item is avoidance of participation in small groups.

The internal consistency of the scales was analyzed considering the item–rest correlations. Analysis of the item–rest correlation helps to determine how much an item serves as a potential contributor to what the scale intends to measure. As shown in Table 2, the item–rest correlation for the fear subscale and the avoidance subscale were higher than 0.40, except for items 1, 18, 21, and 22 in the fear subscale. Accordingly, in this study, there are only four items that are between 0.36 and 0.40. These items are all maintained, as their deletion would not bring about meaningful change in the item–rest correlation of the scale.

## Reliability of the LSAS-Amh

Internal consistency (a measure of a test based on correlations among all items) of the scale or its subscales was assessed using Cronbach's (1951) alpha coefficient. It should also be noted that the internal consistency computed for the subscales and the total score for the LSAS

**Table 2** The LSAS-scale items, item means, standard deviation, item-rest correlation in a sample of university students ( $N = 429$ )

LSAS items	Fear subscale		Avoidance subscale	
	Mean (SD)	Item–total correlation	Mean (SD)	Item–total Correlation
1 Telephoning in public (P1)	1.32 (1.01)	0.36	1.30 (1.01)	0.48
2 Participating in small groups (P2)	1.35 (1.09)	0.43	1.28 (1.08)	0.56
3 Eating in public places (P3)	1.32 (1.08)	0.49	1.34 (1.09)	0.54
4 Drinking with others in public places (P4)	1.29 (1.08)	0.48	1.32 (1.07)	0.51
5 Talking to people in authority (S1)	1.72 (0.97)	0.56	1.43 (0.96)	0.58
6 Acting, performing or giving a talk in front of an audience (P5)	1.66 (1.03)	0.46	1.49 (0.99)	0.55
7 Going to a party (S2)	1.30 (1.05)	0.42	1.37 (1.01)	0.44
8 Working while being observed (P6)	1.43 (1.04)	0.49	1.45 (1.05)	0.58
9 Writing while being observed (P7)	1.20 (1.11)	0.47	1.36 (1.09)	0.57
10 Calling someone you do not know very well (S3)	1.49 (1.03)	0.51	1.32 (1.06)	0.58
11 Talking with people you do not know very well (S4)	1.58 (1.02)	0.52	1.46 (1.01)	0.55
12 Meeting strangers(S5)	1.41 (1.04)	0.53	1.43 (1.05)	0.61
13 Urinating in a public bathroom (P8)	1.39 (1.31)	0.40	1.56 (1.12)	0.49
14 Entering a room when others are already seated (P9)	1.43 (0.97)	0.50	1.48 (1.04)	0.57
15 Being the center of attention (S6)	1.74 (0.97)	0.47	1.56 (1.03)	0.48
16 Speaking up at a meeting (P10)	1.72 (0.99)	0.40	1.48 (1.05)	0.44
17 Taking a test (P11)	1.47 (1.05)	0.45	1.44 (1.11)	0.52
18 Expressing a disagreement or disapproval to people you do not know very well (S7)	1.46 (1.04)	0.38	1.51 (1.05)	0.51
19 Looking into the eyes of people you do not know very well (S8)	1.63 (0.94)	0.41	1.39 (0.98)	0.45
20 Giving a report to a group (P12)	1.74 (1.02)	0.46	1.57 (1.04)	0.53
21 Trying to pick someone up (P13)	1.55 (1.07)	0.38	1.52 (1.06)	0.51
22 Returning goods to a store (S9)	1.71 (1.02)	0.39	1.52 (1.06)	0.52
23 Giving a party (S10)	1.59 (1.03)	0.43	1.55 (1.04)	0.51
24 Resisting a high-pressure salesperson (S11)	1.41 (1.08)	0.44	1.48 (1.12)	0.54

All item–total correlation coefficients are significant at the 0.001 level of probability. *S* social situation, *P* performance situation

exceed 0.60 (Cortina 1993) and range between 0.87 and 0.92, indicating sufficient reliability for using the measure in clinical settings (Rosenthal and Rosnow 1991). Moreover, to determine the magnitude of the correlations, the following standards were used: 0 to 0.25 as weak, 0.26 to 0.50 as moderate, 0.51 to 0.70 as strong, and above 0.71 as very strong (Streiner and Norman 2003). Accordingly, very strong correlations are revealed between the subscales and the social anxiety construct (see Table 3).

Pearson's correlation between the total score of the LSAS-Amh scale and its subscales was calculated. The total score highly correlates to its subscales of avoidance ( $r = 0.88$ ) and for the subscales of fear ( $r = 0.88$ ). The two subscales have a correlation value of ( $r = 0.49$ ). It is noted that the correlation between the subscales and the total score of the scale LSAS-Amh is significant and expressive.

### Construct Validity of the LSAS-Amh

Assessments of the goodness-of-fit indices were performed by administering the chi-square goodness-of-fit test ( $\chi^2$ ), root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker–Lewis index (TLI), and standardized root mean square residual (SRMR) values. The recommended cut-offs for determining an acceptable fit (TLI and CFI > 0.9, RMSEA < 0.08) were followed. Accordingly, as shown in Table 4, the original factor structure displays an adequate fit, following two modifications.

After remedying discrepancies through performing two modifications suggested by the modification indices between two items (*eating in public places—item 3* and *drinking with others in public places—item 4*) in the avoidance (77) and fear (82) subscales, the model shows acceptable fit indices. Based on the CFA results, the two-factor model of the LSAS shows relatively better model fit indices ( $\chi^2 (2934.79, N = 429) = 1077, p < 0.001, RMSEA = 0.06, CFI = 0.92, TLI = 0.92, SRMR = 0.07$ ) compared to the four-factor model structure ( $\chi^2 (3066.72, N = 429) = 1074, p < 0.001, RMSEA = 0.07, CFI = 0.91, TLI = 0.91, SRMR = 0.07$ ). The factor loadings also range between 0.34 and 0.65. Accordingly, the two-factor structure of the LSAS is valid in the context of the Ethiopian university students' population.

### Change with Treatment

A valid scale is expected to change with the introduction of active treatment and to remain unchanged without treatment. Accordingly, the second study, which was based on a quasi-experimental study design, was conducted to assess the treatment sensitivity of the scale. The independent variables were the solution-focused and social skill training programs applied to the two treatment groups. The dependent variable was social anxiety. The two interventions differ primarily in the extent to which each session uses strength/solution-focused strategies or the extent to which sessions rely on learning and the practice of assertiveness skills. Solution-

**Table 3** Correlations, descriptive measures, and Cronbach alphas of the LSAS-Amh subscales

	1	2	3	Mean	SD	$\alpha$
Total score	–	0.88***	0.84***	35.91	12.55	0.92
Avoidance subscale		–	0.49***	34.60	14.44	0.91
Fear subscale			–	70.51	23.33	0.87

$N = 330$ . \*\*\* $p < .001$ ;  $\alpha$  = Cronbach's alpha ( $n$ 's range from 0.873 to 0.92)



**Table 4** Fit index values for the different tested models for the LSAS-Amh

Model	No. of factors/items	$\chi^2$ (df)	Relative $\chi^2$ fit index	RMSEA	TLI	CFI	SRMR
The original LSAS	Fear and avoidance	2934.79 (1077)	2.90	0.06	0.92	0.92	0.07
	SIF, SIA, PF, and PA	3066.72 (1074)	2.86	0.07	0.91	0.91	0.07
	SIF, SIA, PF, PA, fear, and avoidance	3133.77 (1070)	2.93	0.07	0.91	0.91	0.12

$n = 429$ . *RMSEA* root mean square of approximation, *NNFI* non-normed fit index, *TLI* Tucker–Lewis index, *CFI* comparative fit index, *SRMR* standardized root mean square residual, *SIF* social interaction fear, *SIA* social interaction avoidance, *PF* performance fear, *PA* performance avoidance

focused therapy (Ateş and Gençdoğan 2017) and social skill training (Bögels and Voncken 2008; Olivares-Olivares et al. 2019) were found to be effective in treating social anxiety.

Prior to the interventions, the Amharic version of LSAS was administered to 158 university students who consented to take part in the pre-intervention assessment. However, only thirty-two participants completed both the pre-test and the post-test intervention assessments. The inclusion criteria were as follows: pre-intervention assessment scores, willingness to participate in the intervention, suitability of the group programs to their personal objectives, their commitment to participate in all of the sessions, and the suitability of their class schedule in line with possible time gaps to run the interventions. Therefore, treatment sensitivity of the LSAS-Amh was evaluated using a sample of thirty-two participants, who were randomly assigned to either of the active treatments or waiting list conditions.

The two treatments, namely, solution-focused (nine sessions) and social skill training (six sessions) focused upon managing social anxiety through either a strength-based solution-focused approach or through learning and practicing social skills, respectively. The sessions took around ninety minutes and continued for six consecutive weeks. The results of the mean differences across the pre-intervention and the post-intervention were not the same at the post-test across the treatment groups and the waiting list groups. There was reduction in social anxiety for the treatment groups compared to the no treatment group condition (Table 5).

Analysis of the one-way ANOVA determines whether the difference between groups in the social anxiety mean scores at the post-test are significant or not and demonstrates the significant main effects of the interventions [ $F(2, 29) = 8.74, p = 0.001, \eta^2 = 0.38$ ]. This means that participation in the interventions results in a significant difference in the participants' social anxiety at the post-test compared to the no-intervention group. The established change in the post-test score of social anxiety in the treatment groups strengthens the validity of the LSAS-Amh scale. However, in the case of the no-treatment group condition, the scores on the LSAS-Amh scale do not show significant change, indicating that these scales are stable over time, consistent with the test–retest analyses.

**Table 5** One-way Analysis of Variance for group differences in social anxiety at the post-test

Variable	Source of variation	Sum of squares	df	Mean square	<i>F</i>	Sig.	$\eta^2$
Social anxiety	Effect between groups						
	Interventions	5170	2	2585	8.74	0.001	0.38
	Residual	8577	29	296			

*df* degree of freedom, *F* *F*-test,  $\eta^2$  eta-squared; \* $p < 0.05$

## Discussion

The aim of this study is to test the psychometric properties of the Ethiopian Amharic version of the Liebowitz Social Anxiety Scale (LSAS). There are two objectives of this study. First, to determine if the factor structure of the two-factor structure of the LSAS best fits a sample of Amharic-speaking Ethiopian university students. Second, to determine whether the LSAS-Amh exhibits good psychometric properties: internal consistency, validity, and sensitivity to treatment. The data suggests that the best way to interpret the LSAS-Amh scale would be to consider the use of a total fear score, a total avoidance score, and an overall social anxiety score in a non-clinical sample.

The two studies indicate that the Amharic version of the LSAS has high validity, high reliability, and high sensitivity to treatment. The first study indicates that the two-factor model of the LSAS provides better adequate fit to the study data, indicating the need for separate rating between fear/anxiety and avoidance rating. These findings are consistent with previous research (Soykan et al. 2003; Yao et al. 1999) that report fear and avoidance as functionally different. However, our findings are inconsistent with those of Heimberg et al. (1999), which suggests that fear and avoidance ratings might not measure separate constructs. It should be noted that the observation by Heimberg et al. (1999) was made based on a clinical sample of social anxiety disorder. Moreover, the two-factor structure shown in this study could be partially justified by the detailed adaptation procedures followed and expert comments obtained in the process of validating the construct validity.

Considering the internal consistency, the values found in the first study demonstrate good reliability, being above 0.87 for both the total score and for the subscales. Consequently, Cronbach's alpha for the Amharic version of the LSAS is the same or similar to other studies (Bobes et al. 1999; Dos Santos et al. 2013; Soykan et al. 2003; Terra et al. 2006; Yao et al. 1999). These studies report high reliability values regardless of the differences in the sample characteristics and cultural context of the studies. The good psychometric properties and good treatment sensitivity demonstrated by the Amharic version of the LSAS indicates the good utility of the scale.

Psychological measures (scales) are expected to be sensitive to client's psychological conditions over time following psychological interventions. Results from the current study suggested that the LSAS-Amh demonstrated sensitivity to the treatments based on solution-focused and social skill training group programs. In other words, the sensitivity of the items in LSAS-Amh in distinguishing the changes between the treatment and no treatment groups was shown during the post-intervention assessment scores. This is consistent with previous research (Baker et al. 2002) that report treatment sensitivity of the self-report version of the LSAS. Hence, it seems very useful that the items in the LSAS-Amh were sensitive enough to allow clients to notice the changes and assess their rate of fear and avoidance of situations over time following the treatments. Therefore, researchers can use the LSAS-Amh to engage in the assessment of the prevalence of social anxiety and the effectiveness of interventions to manage social anxiety.

Although there are important findings in relation to the psychometric properties of the LSAS-Amh scale, it is crucial that the results are interpreted with caution. First, the validity of the LSAS-Amh was examined using construct validity. Convergent and divergent validity was not performed due to a lack of access or absence of other validated psychological measures. Second, as an alternative assessment for internal consistency, a test-retest reliability analysis was not performed during this study, due to time limitations of the first author related to

doctoral research undertakings. Future studies are recommended considering this limitation. Third, though there was a significant number of participants, it was only based on university students. Therefore, there is a need for caution in the generalization of the data for people of other sociocultural levels. Further validation studies with different samples of an Amharic speaking population could address this limitation.

## Conclusion

The present study confirms that the LSAS-Amh is a reliable and valid measure of social anxiety. This adapted scale can be used to determine psychological support needs related to the social anxiety of Ethiopian university students and the effectiveness of psychological intervention. In addition, together with its ability to assess social anxiety tendencies of Ethiopian university students in the USA and Europe, the adapted scale may also be used to undertake cross-cultural research with students of diverse cultural characteristics.

## Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

**Ethical Approval** All procedures performed in this study involving human participants were in accordance with the ethical standards of University's Research Ethics Board and with the 1975 Helsinki Declaration.

**Informed Consent** Informed consent was obtained from all participants.

## References

- Abbink, J. (1997). The shrinking cultural and political space of East African pastoral societies. *Nordic Journal of African Studies*, 6(1), 1–17.
- Abebe, A.M., Kebede, T.G. and Mengistu, F. (2018). Prevalence of stress and associated factors among regular students at Debre Birhan governmental and nongovernmental health science colleges north Showa zone, Amhara region, Ethiopia. *Psychiatry Journal*, 1–17. <https://doi.org/10.1155/2018/7534937>.
- Ateş, B., & Gençdoğan, B. (2017). Analyzing the effects of solution focused group psychological counseling upon university students' coping with social phobia. *Inonu University Journal of the Faculty of Education*, 18(1), 188–203. <https://doi.org/10.17679/inuefd.306513>.
- Baker, S. L., Heinrichs, N., Kim, H. J., & Hofmann, S. G. (2002). The Liebowitz social anxiety scale as a self-report instrument: a preliminary psychometric analysis. *Behaviour Research and Therapy*, 40(6), 701–715. [https://doi.org/10.1016/S0005-7967\(01\)00060-2](https://doi.org/10.1016/S0005-7967(01)00060-2).
- Behling, O., & Law, K. S. (2000). *Translating questionnaires and other research instruments: problems and solutions*. Thousand Oaks: SAGE Publications, Inc.. <https://doi.org/10.4135/9781412986373>.
- Beidel, D. C., Rao, P. A., Scharfstein, L., Wong, N., & Alfano, C. A. (2010). Social skills and social phobia: an investigation of DSM-IV subtypes. *Behaviour Research and Therapy*, 48(10), 992–1001. <https://doi.org/10.1016/j.brat.2010.06.005>.
- Bobes, J., Badía, X., Luque, A., García, M., González, M. P., & Dal-Ré, R. (1999). Validation of the Spanish version of the Liebowitz Social Anxiety Scale, Social Anxiety and Distress Scale and Sheehan Disability Inventory for the evaluation of social phobia. *Medicina Clínica*, 112(14), 530–538.
- Bögels, S. M., & Voncken, M. (2008). Social skills training versus cognitive therapy for social anxiety disorder characterized by fear of blushing, trembling, or sweating. *International Journal of Cognitive Therapy*, 1(2), 138–150. <https://doi.org/10.1521/ijct.2008.1.2.138>.
- Borsa, J. C., Damásio, B. F., & Bandeira, D. R. (2012). Adaptação e validação de instrumentos psicológicos entre culturas: algumas considerações. *Paidéia (Ribeirão Preto)*, 22(53), 423–432. <https://doi.org/10.1590/S0103-863X2012000300014>.

- Bowman, N. A. (2010). The development of psychological well-being among first-year college students. *Journal of College Student Development*, 51(2), 180–200. <https://doi.org/10.1353/csd.0.0118>.
- Carmona-Halty, M., Schaufeli, W. B., Llorens, S., & Salanova, M. (2019). Satisfaction of basic psychological needs leads to better academic performance via increased psychological capital: a three-wave longitudinal study among high school students. *Frontiers in Psychology*, 10(2113). <https://doi.org/10.3389/fpsyg.2019.02113>.
- Chavira, D., Stein, M., Bailey, K., & Stein, M. (2004). Child anxiety in primary care: prevalent but untreated. *Depression and Anxiety*, 20, 155–164. <https://doi.org/10.1002/da.20039>.
- Clark, D. M., & Wells, A. (1995). A cognitive model of social phobia. In G. Heimberg, M. R. M. R. Liebowitz, D. Hope, & F. Scheier (Eds.), *Social phobia: diagnosis, assessment, and treatment* (pp. 69–93). New York: The Guilford Press.
- Cortina, J. M. (1993). What is coefficient alpha? An examination of theory and applications. *Journal of Applied Psychology*, 78(1), 98–104. <https://doi.org/10.1037/0021-9010.78.1.98>.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16, 297–334. <https://doi.org/10.1007/BF02310555>.
- Cox, B. J., Ross, L., Swinson, R. P., & Drenfeld, D. M. (1998). A comparison of social phobia outcome measures in cognitive-behavioral group therapy. *Behavior Modification*, 22(3), 285–297. <https://doi.org/10.1177/01454455980223004>.
- Dachew, B. A., Biftu, B. B., Tiruneh, B. T., Anlay, D. Z., Wassie, M. A., & Betts, K. (2019). Prevalence and determinants of mental distress among university students in Ethiopia: a systematic review protocol. *Systematic Reviews*, 8(1), 47. <https://doi.org/10.1186/s13643-019-0966-z>.
- Deci, E. L., & Ryan, R. M. (2002). *Handbook of self-determination research*. University Rochester Press.
- Dessie, Y., Ebrahim, J., & Awoke, T. (2013). Mental distress among university students in Ethiopia: a cross sectional survey. *Pan African Medical Journal*, 15(95), 1–8. <https://doi.org/10.11604/pamj.2013.15.95.2173>.
- Dos Santos, L. F., Loureiro, S. R., Crippa, J. A. S., & de Lima Osório, F. (2013). Adaptation and initial psychometric study of the self-report version of Liebowitz Social Anxiety Scale (LSAS-SR). *International Journal of Psychiatry in Clinical Practice*, 17(2), 139–143. <https://doi.org/10.3109/13651501.2012.710336>.
- Dyson, R., & Renk, K. (2006). Freshmen adaptation to university life: depressive symptoms, stress, and coping. *Journal of Clinical Psychology*, 62(10), 1231–1244. <https://doi.org/10.1002/jclp.20295>.
- Fresco, D., Coles, M., Heimberg, R., Liebowitz, M., Hami, S., Stein, M., & Goetz, D. (2001). The Liebowitz Social Anxiety Scale: a comparison of the psychometric properties of self-report and clinician-administered formats. *Psychological Medicine*, 31(6), 1025–1035. <https://doi.org/10.1017/S0033291701004056>.
- Gebreegziabher, Y., Girma, E., & Tesfaye, M. (2019). Help-seeking behavior of Jimma university students with common mental disorders: a cross-sectional study. *PLoS One*, 14(2), e0212657. <https://doi.org/10.1371/journal.pone.0212657>.
- Gilboa-Schechtman, E., Franklin, M. E., & Foa, E. B. (2000). Anticipated reactions to social events: Differences among individuals with generalized social phobia, obsessive com-pulsive disorder, and nonanxious controls. *Cognitive Therapy and Research*, 24, 731–746. <https://doi.org/10.1023/A:1005595513315>.
- Haile, Y. G., Alemu, S. M., & Habtewold, T. D. (2017). Common mental disorder and its association with academic performance among Debre Berhan University students, Ethiopia. *International Journal of Mental Health Systems*, 11, 34. <https://doi.org/10.1186/s13033-017-0142-6>.
- Heimberg, R. G., Horner, K. J., Juster, H. R., Safren, S. A., Brown, E. J., Schneier, F. R., & Liebowitz, M. R. (1999). Psychometric properties of the Liebowitz Social Anxiety Scale. *Psychological Medicine*, 29, 199–212. <https://doi.org/10.1017/S0033291798007879>.
- Hofmann, S. G. (2007). Cognitive factors that maintain social anxiety disorder: a comprehensive model and its treatment implications. *Cognitive Behavior Therapy*, 36(4), 193–209. <https://doi.org/10.1080/16506070701421313>.
- Hu, L., & Bentler, P. (1998). Fit indices in covariance structure modeling: sensitivity to underparameterized model misspecification. *Psychological Methods*, 3(4), 424–453. <https://doi.org/10.1080/10705519909540118>.
- Levin, J. B., Marom, S., Gur, S., Wechter, D., & Hermesh, H. (2002). Psychometric properties and three proposed subscales of a self-report version of the Liebowitz Social Anxiety Scale translated into Hebrew. *Depression and Anxiety*, 16(4), 143–151. <https://doi.org/10.1002/da.10064>.
- Liebowitz, M. R. (1987). Social phobia. *Modern Problems in Pharmacopsychiatry*, 22, 141–173. <https://doi.org/10.1159/000414022>.
- Monteiro, N. M., & Balogun, S. K. (2013). Perceptions of mental illness in Ethiopia: a profile of attitudes, beliefs and practices among community members, healthcare workers and traditional healers. *International Journal of Culture and Mental Health*, 7(3), 259–272. <https://doi.org/10.1080/17542863.2013.784344>.

- Oakman, J., Van Ameringen, M., Mancini, C., & Farvolden, P. (2003). A confirmatory factor analysis of a self-report version of the Liebowitz Social Anxiety Scale. *Journal of Clinical Psychology*, *59*(1), 149–161. <https://doi.org/10.1002/jclp.10124>.
- Olivares-Olivares, P. J., Ortiz-González, P. F., & Olivares, J. (2019). Role of social skills training in adolescents with social anxiety disorder. *International Journal of Clinical and Health Psychology : IJCHP*, *19*(1), 41–48. <https://doi.org/10.1016/j.ijchp.2018.11.002>.
- Rosenthal, R., & Rosnow, R. L. (1991). *Essentials of behavioral research: methods and data analysis* (2nd ed.). New York: McGraw Hill.
- Russell, G., & Topham, P. (2012). The impact of social anxiety on student learning and well-being in higher education. *Journal of Mental Health*, *21*(4), 375–385. <https://doi.org/10.3109/09638237.2012.694505>.
- Ryan, R. M., & Deci, E. L. (2017). Psychological needs: varied concepts and a preliminary description of SDT's approach. In R. M. Ryan & E. L. Deci (Eds.), *Self-determination theory: basic psychological needs in motivation, development, and wellness* (pp. 80–101). London: The Guilford Press.
- Safren, S. A., Heimberg, R. G., Horner, K. J., Juster, H. R., Schneier, F. R., & Liebowitz, M. R. (1999). Factor structure of social fears: the Liebowitz Social Anxiety Scale. *Journal of Anxiety Disorder*, *13*(3), 253–270. [https://doi.org/10.1016/S0887-6185\(99\)00003-1](https://doi.org/10.1016/S0887-6185(99)00003-1).
- Seleshi, Z. & Sentayehu T. (1998). *Parenting style differences among selected ethnic groups in Ethiopia*. Unpublished Research Paper, Forum on Street Children – Ethiopia in Cooperation with Radda Barnen (Swedish Save the Children), Addis Ababa, Ethiopia.
- Soykan, C., Özgüven, H. D., & Gençöz, T. (2003). Liebowitz Social Anxiety Scale: the Turkish version. *Psychological Reports*, *93*(3 Pt 2), 1059–1069. <https://doi.org/10.2466/pr0.2003.93.3f.1059>.
- Streiner, D. L., & Norman, G. R. (2003). *Health measurement scales a practical guide to their development and use*. Oxford: Oxford University Press. <https://doi.org/10.1093/med/9780199685219.001.0001>.
- Terra, M. B., Barros, H. M. T., Stein, A. T., Figueira, I., Athayde, L. D., Gonçalves, M. d. S., Tergolina, L. P., Rovani, J. S., & da Silveira, D. X. (2006). Internal consistency and factor structure of the Portuguese version of the Liebowitz Social Anxiety Scale among alcoholic patients. *Brazilian Journal of Psychiatry*, *28*(4), 265–269. <https://doi.org/10.1590/S1516-44462006005000008>.
- Tesfahunegn, T. B., & Gebremariam, E. H. (2019). Mental distress and associated factors among Aksum University students, Ethiopia: a cross-sectional study. *BMC Psychiatry*, *19*(1), 71. <https://doi.org/10.1186/s12888-019-2051-5>.
- UNESCO Statistics (2018) *Ethiopia | UNESCO UIS - UNESCO Institute for Statistics*. Retrieved on June 2, 2020, from: <http://uis.unesco.org/en/country/et>
- Wondie, Y. (2014). Reflections on the development of psychology in Ethiopia and future directions. *International Review of Psychiatry*, *26*(5), 585–588. <https://doi.org/10.3109/09540261.2014.917611>.
- Yao, S.-N., Note, I., Fanget, F., Albuissou, E., Bouvard, M., Jalenques, I., & Cottraux, J. (1999). L'anxiété sociale chez les phobiques sociaux: Valiation de l'échelle d'anxiété sociale de Liebowitz (version Française) [Social anxiety in social phobics: validation of Liebowitz's social anxiety scale–French version]. *L'Encéphale: Revue de Psychiatrie Clinique Biologique et Thérapeutique*, *25*(5), 429–435.

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.