Thorac Res Pract. **DOI:** 10.4274/ThoracResPract.2026.2025-10-5

Original Article

Reliability and Validity of the Turkish Version of the Lung Transplant-specific Valued Life Activities Scale

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Cite this article as: Ar U, Yekeler E, Çalık E, Çelik Başaran F, Türkkan S. Reliability and validity of the Turkish version of the lung transplant-specific valued life activities scale. *Thorac Res Pract.* [Epub Ahead of Print].

ABSTRACT

OBJECTIVE: The lung transplantation-specific valued life activities (LT-VLA) is a 15-item questionnaire developed to assess limitations in activities of daily living in LT recipients. This study aimed to evaluate the validity and reliability of its Turkish version.

MATERIAL AND METHODS: Twenty-two LT recipients participated in this single-center cross-sectional study. Test-retest reliability was assessed using intraclass correlation coefficients (ICC), and internal consistency was measured with Cronbach's alpha (α). Criterion validity was examined by comparing LT-VLA scores with the Saint George Respiratory Questionnaire, Short Form-12 (SF-12), London Chest Activity of Daily Living Scale (LCADL), and modified Medical Research Council (mMRC) scale.

RESULTS: Cronbach's α values for the mean difficulty, activities affected, and activities unable subscales were 0.945, 0.906, and 0.934, respectively. ICC values ranged from 0.828 to 0.897. The mean difficulty score showed a moderate correlation with LCADL self-care (r = 0.543, $P = 0.009$) and SF-12 physical (r = –0.532, $P = 0.011$). The activities affected subscale was correlated with SF-12 physical (r = –0.587, $P = 0.004$) and with mMRC (r = 0.563, $P = 0.006$).

CONCLUSION: The Turkish version of the LT-VLA is a reliable and valid tool for assessing activity limitations in LT recipients. It will be a useful and feasible tool for rehabilitation professionals to assess activity limitations in LT recipients undergoing pulmonary rehabilitation.

KEYWORDS: Lung Transplantation, rehabilitation, activities of daily living, quality of life, treatment outcome

Received: 08.10.2025 ***Revision Requested:*** 15.12.2025 ***Last Revision Received:*** 16.12.2025

Accepted: 21.01.2026 ***Epub:*** 24.03.2026

INTRODUCTION

Lung transplantation (LT) is a life-saving therapeutic intervention for patients with end-stage lung disease that also enhances health-related quality of life (HRQL) and improves patient-centered outcomes (PCOs).[1] Reported survival rates in lung transplant recipients are 85% at one year and 59% at five years.[2] These improved survival outcomes have increased the importance of evaluating HRQL and activities of daily living (ADLs) in this patient group, according to the framework of the International Classification of Functioning (ICF), Disability and Health.[3,4]

The poorer quality of life and limitations in ADLs of lung transplant recipients are multifactorial in origin.[5] Graft-related complications such as chronic lung allograft dysfunction and bronchiolitis obliterans syndrome may lead to functional limitations due to deterioration in pulmonary function.[6] Corticosteroid-induced myopathy, infectious disorders, and tacrolimus-related neurotoxicity impair functional capacity and are recognized adverse effects of immunosuppressive therapy.[7] This progressive deterioration frequently results in clinically significant limitations in ADLs.[8] Furthermore,

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post-transplant complications, including critical illness polyneuromyopathy, inactivity-induced sarcopenia, and post-transplant diabetes mellitus, may substantially compromise ADLs.[9]

In the literature, patients' ability to perform ADLs and patients' quality of life are considered essential metrics of post-lung transplant outcomes.[10] Furthermore, the assessment of HRQL and ADLs is a critical parameter for evaluating the effectiveness of pulmonary rehabilitation programs for transplant recipients.[11] The LT-specific valued life activities (VLA) scale, developed by Singer et al.[12], is a brief and practical tool designed to assess limitations in ADLs among lung transplant candidates and recipients. The LT-VLA was designed to assess not only basic ADLs but also more complex and personally valued activities that contribute to enjoyment and overall quality of life, such as social interaction, travel, and leisure pursuits. This broader scope represents a key feature that distinguishes the LT-VLA from traditional ADL-based measures. In the original validation study of the LT-VLA, the 15-item LT-VLA demonstrated high internal consistency [Cronbach's alpha (α) = 0.92] in the lung transplant population and showed moderate correlations with objective clinical measures such as pulmonary function tests and 6-minute walk distance. Furthermore, the LT-VLA scale has proven to be a sensitive measure of clinical improvements after transplantation.[12] PCOs developed for specific disease states outperform generic instruments because of their disease-specific content validity, greater sensitivity to clinical changes, and improved patient compliance achieved through appropriately tailored questions.[13] There are chronic lung disease-specific ADLs assessment tools or questionnaires that evaluates effects of respiratory diseases on activity but none of them corresponds to specific needs for lung transplant populations.[14,15] There is also a lack of knowledge about the most appropriate ADL evaluation tools for patients with chronic respiratory disorders.[16]

Therefore, the cultural and linguistic adaptation of the LT-VLA scale into Turkish can enable the objective assessment of disability levels in patients' ADLs in both clinical practice and research, providing a valuable ICF-based outcome.[17] The objective of this study is to evaluate the validity and reliability of the Turkish version of the LT-VLA scale to assess limitations in ADLs among lung transplant recipients.

Main Points

- Turkish version of the lung transplant-specific valued life activities (LT-VLA) scale was developed and tested for reliability and validity in LT recipients.
- The scale showed excellent internal consistency with Cronbach's alpha values between 0.906 and 0.945.
- Test-retest reliability was high with intraclass correlation coefficient values ranging from 0.828 to 0.897 and criterion validity was confirmed with moderate correlations to Short Form-12, London Chest Activity of Daily Living Scale, and modified Medical Research Council.
- Turkish LT-VLA is a valid and reliable tool for assessing activity limitations in LT recipients and can be used in pulmonary rehabilitation practice.

MATERIAL AND METHODS

Study Design and Participants

Twenty-two lung transplant recipients who were followed up at the Chest Surgery Clinic of Ankara Bilkent City Hospital were included in this cross-sectional methodological study between February 2024 and March 2025. The inclusion criteria for the study were: at least three months since LT, an acceptable level of cooperation, the ability to read and understand Turkish, an age between 18 and 70 years, and willingness to participate in the study. Patients who underwent single-LT, those unable to read or understand Turkish, and those with difficulties cooperating were excluded from the study. Only bilateral lung transplant recipients were included in the study. The primary reason for excluding single-lung transplant recipients was to ensure methodological homogeneity of the study sample and minimize potential confounding factors. Bilateral and single-lung transplant procedures may differ in terms of postoperative physiological capacity, complication profiles, and long-term functional outcomes. Therefore, in this validation study that evaluated the psychometric properties of the LT-VLA scale, a homogeneous patient group (bilateral lung transplant recipients) was preferred to avoid potential confounding from different functional and symptomatic profiles associated with transplant type that could affect scale performance and validity coefficients. The study was approved by the Ankara Bilkent City Hospital No. 1 Clinical Research Ethics Committee (date: 29.11.2023, approval number: E1-23-4215). The scope and purpose of the study were explained, and written informed consent forms were obtained from all participants.

Sample Size Calculation

The sample size calculation was performed based on the number of items and the minimum acceptable and expected values of Cronbach's α to achieve power (1-β) = 80% using a sample-size calculator for reliability studies.[18] Therefore, the minimum required sample size was 20. Finally, we were able to reach 22 patients with LT.

Data Collection Tools

All questionnaires and scales were administered during clinical follow-up visits by a researcher using face-to-face interviews, and participants' verbal responses were recorded.

Sociodemographic and Clinical Data

The sociodemographic, physical and clinical data, including age, body mass index, the presence of supplemental oxygen support, smoking history, education level, and last lung function test results were recorded for all patients. The assesment data were through face-to-face inter-views with patients during routine follow-up visits.

The Lung Transplantation Specific Valued Living Activities Scale

The LT-VLA scale, developed by Singer et al.[12], is a brief, valid, and practical-to-administer disease-specific assessment tool designed to determine limitations in ADLs among lung transplant candidates and recipients. This tool assesses levels of disability

in three domains: obligatory (e.g., self-care), committed (e.g., work), and discretionary (e.g., social activities). Participants rate the difficulty of performing each activity on a 4-point Likert scale (0 = no difficulty; 3 = unable to perform). They also have the option to mark items as "does not apply". The LT-VLA scale produces three summary scores: mean difficulty, proportion of activities affected, and proportion of activities not applicable.[12] The LT-VLA scale generates three summary scores to assess disability severity: I) mean difficulty score (range: 0–3), calculated as the sum of item scores divided by total items rated, where scores near 0 indicate minimal disability (activities performed easily), 1.5–2 reflect moderate disability (significant difficulty), and scores approaching 3 denote severe disability (inability to perform activities); II) percentage of affected activities, derived from the proportion of items scored ≥1 (any difficulty), with 0–30% indicating mild disability (limited impact), 50–80% moderate-severe disability (broad limitations), and 100% universal difficulty; III) percentage of unable-to-perform activities, based on items scored = 3 (unable to perform), where 0–10% suggests minimal functional loss, 20–50% significant limitations (including basic activities), and >50% profound disability. These metrics collectively quantify disability progression and post-transplant recovery, as validated in the original study.

The Saint George Respiratory Questionnaire

The Saint George Respiratory Questionnaire (SGRQ) was used to assess disease-specific HRQL. The SGRQ consists of 76 items and yields a total score and three domain scores (symptoms, activity, and impacts). The total scores for each domain range from 0 (no effect on HRQL) to a maximum score of 100 (maximum perceived distress), and a higher score reflects lower HRQL.[15,19]

The Short Form-12

The Short Form-12 (SF-12) was used to assess generic quality of life. SF-12 includes 12 items that generate two summary scores: the physical component summary (PCS) and the mental component summary. The scores for each component range from 0 to 100, with higher scores indicating better health status.[20,21]

The London Chest Daily Life Activity Scale

The London Chest Daily Life Activity Scale (LCADL) was used to assess dyspnea-related limitations in daily activities in patients with chronic lung disease. This scale consists of 15 items grouped into four domains: self-care, domestic, physical activity, and leisure. Each item is scored based on the degree of dyspnea experienced during the activity. Total LCADL scores range from 0 to 75, with higher scores indicating greater activity limitation due to breathlessness.[14,22]

The Modified Medical Research Council Dyspnea Scale

The modified Medical Research Council (mMRC) dyspnea scale was used to assess the degree of breathlessness during daily life. The mMRC scale is a single-item, five-point scale (ranging from 0 to 4), which reflects the level of activity that provokes dyspnea. A higher score indicates more severe breathlessness and greater functional limitation.[23,24]

Translation and Adaptation Procedure of LT-VLA Scale

First, written permission was obtained via email from the original developers of the scale to investigate the validity and reliability of the Turkish version of the LT-VLA scale. As a first step, the LT-VLA scale was translated into Turkish by two native Turkish speakers proficient in English, after obtaining permission from the authors of the original versions to translate and use the questionnaires. The two translators were physiotherapists specializing in cardiopulmonary rehabilitation. The two Turkish translations were synthesized into a single consensus version by the two translators. Two native English-speaking translators back-translated the final Turkish version of the LT-VLA scale during the back-translation step. These two back-translated versions were synthesized into a final version by consensus among the translators. The consensus English version was sent to the corresponding author of the original version (Jonathan Paul Singer) for final review. After the corresponding author's final check and revisions were completed, the final version of the LT-VLA scale was created.[17]

The LT-VLA was applied to participants twice, 30 minutes apart, to determine test-retest reliability. Four instruments (mMRC, SGRQ, SF-12, LCADL) were used to evaluate criterion validity.

Statistical Analysis

Statistical analyses were performed using the IBM Statistical Package for the Social Sciences (IBM SPSS Corp., Armonk, NY, USA), version 23.0 for Windows. The data were expressed as mean ± standard deviation and minimum-maximum values for quantitative variables and as percentage (%) for categorical variables. The criterion validity of the LT-VLA was assessed using Spearman correlation analysis between the Turkish version of the LT-VLA scale and the mMRC score, SF-12 scores, LCADL (total and subscale scores), and SGRQ (total and subscale scores). Correlation strengths were interpreted as very weak ($|r|<0.1$), weak ($0.1\leq|r|<0.3$), moderate ($0.3\leq|r|<0.7$), strong ($0.7\leq|r|<0.9$), or very strong ($|r|\geq0.9$) based on Schober et al.[25], with all observed correlations in this study falling within the moderate range ($0.3\leq|r|<0.7$). The internal consistency of the LT-VLA was assessed using Cronbach's α coefficient. A Cronbach's α value of $0.60 \leq \alpha \leq 0.79$ is considered quite reliable and $\alpha \geq 0.80$ is considered highly reliable.[26] The test-retest reliability was measured using the intraclass correlation coefficients (ICC), which indicates excellent reliability of the instrument if ICC ≥0.80.[27] The probability of error in the statistical analyses was set at $P < 0.05$.

RESULTS

Twenty-two lung transplant recipients (mean age: 45.63±14.59 years, 36.4% female, 63.6% male) were included in the study. The time since transplantation ranged from 3 to 180 months among patients (mean time: 64.86±43.48 months). The underlying diseases necessitating transplantation were chronic obstructive pulmonary disease (COPD) in 9 patients (40.9%), interstitial lung disease (ILD) in 8 patients (36.4%), cystic fibrosis (CF) in 3 patients (13.6%), and pulmonary hypertension (PH) in 2 patients (9.1%). The sociodemographic and clinical data of the patients in the study are shown in Table 1.

Test-retest Reliability

Internal consistency and test-retest reliability of the LT-VLA scale are shown in Table 2. The Cronbach's α value of the mean difficulty, activities affected and activities unable subscales of LT-VLA test and retest scores were recorded as ≥0.80 indicating that the scale is highly reliable and have excellent internal consistency (0.945, 0.906, 0.934 respectively, Table 2). The test-retest ICC values for each subscale of LT-VLA were above 0.80, indicating excellent reliability, as shown in Table 2. The mean ICC values ranged from 0.828 to 0.897. The LT-VLA subscale scores were also strongly and significantly correlated with their retest scores ($P < 0.001$, Table 2).

Criterion Validity

The correlation coefficients between the LT-VLA score and the criterion questionnaires are presented in Table 3. The correlation analysis revealed that LT-VLA mean difficulty scores were moderately correlated with the SGRQ symptom score and with the LCADL self-care and physical activity scores. Additionally, LT-VLA mean difficulty scores showed a moderate negative correlation with the SF-12 physical scores and a moderate positive correlation with the mMRC scores. Furthermore, LT-VLA mean difficulty score was moderately correlated with waiting time on the transplant list (r = 0.426; $P = 0.048$). The LT-VLA activities affected scores showed moderate correlations with the SGRQ symptom scores, LCADL self-care scores, SGRQ total scores, and mMRC scores, as well as a moderate negative correlation with the SF-12 physical scores. Waiting time on the transplant list was moderately correlated with the LT-VLA mean difficulty subscore (r = 0.426, $P = 0.048$). Otherwise, all LT-VLA subscales showed no statistically significant associations with spirometric measures ($P > 0.05$). The relationship between SGRQ-symptom score and LT-VLA mean difficulty score and the relationship between SF-12 physical score and LT-VLA activities affected score are presented in Figures 1 and 2.

Table 1. The demographic and clinical data of the lung transplant recipients

LT recipients (n = 22)	Mean ± SD	Min-max
Age (years)	45.63±14.59	22–69
Height (cm)	166.64±7.42	153–180
Weight (kg)	66.95±12.91	42–92
BMI (kg/m²)	24.21±4.01	16.82–33.79
Smoking exposure (pack-years)	22.04±28.45	2–42
FEV_1 (%)	71.81±30.85	22–121
FVC (%)	72.63±22.84	30–115
FEV_1/FVC (%)	79.37±17.32	37.50–99.80
PEF (%)	6.93±6.79	1.46–36
MMRC score (0–4)	0.86±0.88	0–3
Time elapsed after transplantation (months)	64.86±43.48	3–180
Waiting time on the transplant list (months)	23.81±18.40	3–60

LT: lung transplantation, SD: standard deviation, Min: minimum, max: maximum, BMI: body mass index, FEV_1: forced expiratory volume in 1 second, FVC: forced vital capacity, FEV_1/FVC: ratio of forced expiratory volume in 1 second to forced vital capacity, PEF: peak expiratory flow, mMRC: modified Medical Research Council Dyspnea scale

DISCUSSION

The main finding of this study was that the Turkish version of the LT-VLA scale had excellent reliability and internal consistency. The Turkish version of LT-VLA is a valid PCO that demonstrates associations with generic and HRQL measures and with dyspnea perception during daily activities. The Turkish version of the LT-VLA is a feasible, practical, reliable, and valid assessment tool for evaluating limitations in daily life activities among lung transplant recipients, and it can be used by health professionals for ICF-based assessments within medical and rehabilitation interventions. The principal strength of the LT-VLA in both clinical and research settings lies in its ability to capture not only limitations in basic physical functioning but also restrictions in activities that add meaning and satisfaction to patients' lives. In this respect, the LT-VLA provides a more comprehensive perspective than traditional ADL measures for pre-transplant counseling and post-transplant quality of life monitoring.

Table 2. The internal consistency and ICC values of Turkish version of the LT-VLA scale

	1st test Mean ± SD	2nd test Mean ± SD	
LT-VLA mean difficulty	0.53±0.09	0.47±0.47	r = 0.905
			P = <0.001
LT-VLA activities affected%	31.28±5.49	32.50±31.21	r = 0.873
			P = <0.001
LT-VLA activities unable%	3.44±2.18	4.15±10.86	r = 0.749
			P = <0.001
	Cronbach's α	**ICC**	**95% CI**
LT-VLA mean difficulty	0.945	0.897	0.768–0.956
LT-VLA activities affected%	0.906	0.828	0.631–0.925
LT-VLA activities unable%	0.934	0.877	0.727–0.947

LT-VLA: Lung Transplant Valued Life Activity scale, ICC: intraclass correlation coefficient, CI: confidence interval, SD: standard deviation

Table 3. The bivariate correlations between the LT-VLA score and scores of the criterion scales for criterion validity

Questionnaires for criterion validity	Subscores	LT-VLA mean difficulty		LT-VLA activities affected%	
		r	*P*	r	*P*
SGRQ	Symptom	0.479	**0.024***	0.510	**0.015***
	Total			0.455	**0.033***
LCADL	Self-care	0.543	**0.009***	0.476	**0.025***
	Physical	0.448*	**0.036***	0.479	**0.024***
SF-12	Physical	–0.532	**0.011***	–0.587	**0.004***
mMRC score		0.461	**0.031***	0.563	**0.006***

*Indicates statistically significant difference ($P < 0.05$)

SGRQ: Saint George Respiratory Questionnaire, LCADL: London Chest Activity of Daily Life Scale, mMRC: modified Medical Research Council scale, LT-VLA: Lung Transplant Valued Life Activity scale, SF-12: Short Form-12

To the best of our knowledge, few assessment tools for ADLs in LT recipients and candidates have been adapted for the Turkish population, and most of these are chronic lung disease-specific or generic measures that do not reflect the specific needs of LT patients.[14,15] The present study demonstrated that the Turkish version of the LT-VLA scale subscale scores have high internal consistency level with Cronbach's α value ≥0.80. The Cronbach's α values for the mean difficulty, activities affected, and activities unable subscores of the LT-VLA were 0.945, 0.906, and 0.934, respectively, indicating excellent internal consistency. This shows us that the LT-VLA scores are stable despite the time interval between test and retest. We also showed high ICC values for test-retest reliability (≥0.80) and strong correlation level between test and retest LT-VLA scores for each subscales. Therefore, the Turkish version of the LT-VLA scale demonstrated high reliability for evaluating ADLs among LT recipients. The results obtained with the Turkish version closely resemble those reported in the validation study of the original English version by Singer et al.[12] (Cronbach's α value: 0.92).

We used the mMRC, LCADL, SGRQ, and SF-12 assessment tools to evaluate the criterion validity of the Turkish version of the LT-VLA scale. A moderate correlation was found between mMRC and the LT-VLA mean difficulty and activities affected subscores in LT recipients. Additionally, Singer et al.[12] demonstrated that patients with higher LT-VLA scores had lower forced vital capacity (FCV) values. Patients had increased FVC% and mMRC scores after LT transplantation.[28] As patients' perception of dyspnea during daily life increased, ADL performance was negatively affected. In our study, the dyspnea levels we found to be associated with LT-VLA mean difficulty and activities affected scores are consistent with the literature.[29]

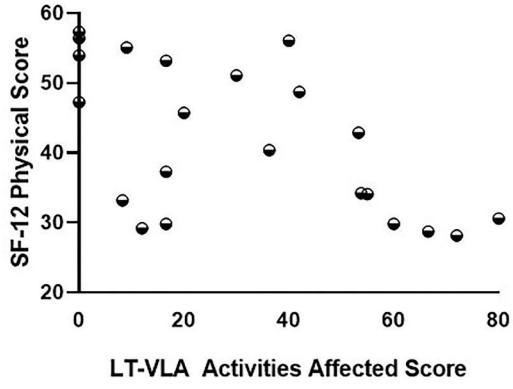

Figure 1. The relationship between SGRQ-symptom score and LT-VLA mean difficulty score

SGRQ: Saint George Respiratory Questionnaire, LT-VLA: Lung Transplant Valued Life Activity scale, SF-12: Short Form-12

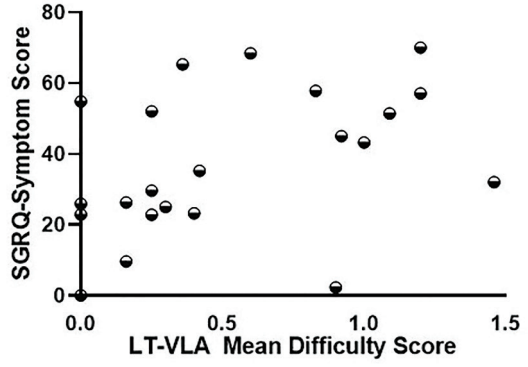

Figure 2. The relationship between SF-12 physical score and LT-VLA activities affected score

SF-12: Short Form-12, LT-VLA: Lung Transplant Valued Life Activity scale, SGRQ: Saint George Respiratory Questionnaire

The LCADL scale is a tool that assesses difficulties in ADLs due to shortness of breath from COPD and other chronic respiratory diseases.[22] Because the LT-VLA scale also assesses limitations, we chose to use it in this validation study. Both the mean difficulty and activities affected scores of the LT-VLA show moderate correlations with the self-care and physical activity scores of the LCADL. This finding confirms the impact of shortness of breath on ADLs in LT recipients, particularly on self-care skills (e.g., dressing, washing) and physical activities (e.g., walking, housework). As shortness of breath worsens, patients experience greater difficulty performing daily activities and report more restricted tasks. Since dyspnea is a critical parameter in LT patients, we believe it is valuable to associate the LT-VLA with a scale that specifically reflects the impact of shortness of breath on daily functioning.

Since the ability to perform ADLs is a key determinant of HRQL, our study incorporated assessments of both HRQL and ADLs as parts of the ICF framework.[5] We found a moderate, significant correlation between the LT-VLA activities affected score and the SGRQ total score. Given that the SGRQ total score reflects a composite of all subparameters, it serves as a comprehensive indicator of overall HRQL. In contrast, the LT-VLA activities affected score specifically indicates limitations in functional activities.[12] This positive correlation suggests that greater functional disability is associated with poorer quality of life. There was a moderate positive correlation among the SGRQ symptom score, LT-VLA mean difficulty score, and activities affected score in our study. This finding indicates that an increased symptom burden-particularly the frequency and severity of respiratory symptoms such as cough, sputum production, wheezing, and dyspnea-negatively affects patients' ability to perform daily activities and increases the number of activities that patients are unable to complete. This result supports the presence of a direct relationship between symptom burden and functional limitation in respiratory diseases.[19] The original English version of the LT-VLA scale was also validated using the SF-12 score.[12] Consistent with the original article, our study found a moderately negative correlation between the SF-12 Physical score and the LT-VLA mean difficulty and activities affected subscale scores. This study demonstrates that when patients perceive themselves as physically healthier, they tend to experience less difficulty in performing daily tasks and report fewer activity limitations. In a study by Seijo et al.[30] examining factors affecting quality of life and survival after LT, a 0.3-unit increase in the LT-VLA mean difficulty score was associated with a 4-point improvement in SF-12 physical scores. The current data from these studies indicate that the correlation between LT-VLA scores and the SF-12 PCS scores is not only

cross-sectional but also sensitive to change over time, such as in repeated assessments during the post-transplant period.

There was also a significant positive correlation between the LT-VLA mean difficulty score and the waiting time on the transplant list. This finding suggests that patients who waited longer for LT tended to report greater difficulty in performing daily activities. From a clinical perspective, this is consistent with the progressive nature of end-stage lung diseases, where prolonged waiting times may be associated with further deterioration in physical functioning.[31] Regarding validity, we consider that this correlation supports the construct validity of the Turkish version of the LT-VLA because it reflects changes in patients' activity limitations over time that are consistent with their clinical status. Therefore, we believe the scale is sensitive to variations in disease burden, further reinforcing its utility in both clinical follow-up and research settings. The lack of significant correlations between LT-VLA scores and spirometric measures suggests that patients' perceived functional limitations may reflect multisystem factors beyond pulmonary function, consistent with the known discordance between objective lung parameters and subjective disability in chronic respiratory diseases.[32]

In our Turkish adaptation of the LT-VLA, we noted that male participants frequently selected the response "This does not apply to me" for household activities (e.g., cooking and cleaning) rather than indicating inability or difficulty. Importantly, and in accordance with the original scoring guidelines, these items were correctly excluded from those participants' total scores. This pattern suggests a lack of participation based on culture or gender role, rather than a true functional limitation. This observation is consistent with findings from other LCADL studies, which show that men often receive a zero score not because they are unaffected by dyspnea, but because they do not perform household tasks.[14] Failing to consider this distinction may result in a misrepresentation of their actual functional status.

Study Limitations

The first limitation of our study was the heterogeneity of the sample, which included LT recipients with various pre-transplant diagnoses such as COPD, ILD, CF, and PH. While this reflects the diversity of clinical practice, it may have introduced variability in functional limitations and symptom perception, potentially affecting LT-VLA responses. Future studies should consider evaluating the psychometric properties of the Turkish LT-VLA in more homogeneous subgroups to determine whether disease-specific adaptations or interpretations are warranted. Another limitation of our study is the relatively small sample size. Although the LT-VLA consists of 15 items, our study included only 22 participants. This sample size is below the generally recommended subject-to-item ratio for validation studies, due to the limited number of eligible and available LT recipients during the study period at a single transplant center.[33] Despite the limited number of participants, we conducted robust psychometric analyses that yielded satisfactory results. Given this, future studies should consider multi-center collaborations to recruit larger and more diverse patient populations, thereby enhancing the generalizability of the findings.

CONCLUSION

In conclusion, the Turkish version of the LT-VLA scale has been validated as a reliable and clinically useful tool for assessing activity limitations in lung transplant recipients. Its practical, self-administered format makes it valuable for multidisciplinary teams, including occupational therapists, physiotherapists, and physicians. For therapists, the scale provides critical insights into patients' challenges with meaningful daily activities, enabling targeted interventions to improve occupational participation and quality of life. Physiotherapists can use the scale to monitor physical function and tailor pulmonary rehabilitation programs, while physicians can integrate patient-reported outcomes with medical assessments to guide comprehensive care. Despite its strengths, limitations, such as the modest sample size and single-center recruitment, suggest the need for further validation in broader populations. Future studies should investigate the scale's responsiveness to various therapeutic interventions, including occupational and physical therapy protocols, to further establish its clinical utility. By offering a standardized measure of functional limitations, the Turkish LT-VLA scale enhances collaborative, patient-centered care and serves as a foundation for developing culturally adapted tools in Türkiye's transplant rehabilitation landscape.

Ethics

Ethics Committee Approval: The study was approved by the Ankara Bilkent City Hospital No. 1 Clinical Research Ethics Committee (date: 29.11.2023, approval number: E1-23-4215).

Informed Consent: The scope and purpose of the study were explained, and written informed consent forms were obtained from all participants.

Footnotes

Authorship Contributions

Surgical and Medical Practices: E.Y., F.Ç.B., S.T., Concept: U.A., E.Ç., Design: U.A., E.Ç., Data Collection or Processing: U.A., Analysis or Interpretation: U.A., E.Ç., Literature Search: U.A., E.Ç., F.Ç.B., S.T., Writing: U.A., E.Ç., F.Ç.B., S.T.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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