Reliability, Validity, and Responsiveness of the Locomotor Capabilities Index in Adults With Lower-Limb Amputation Undergoing Prosthetic Training

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ABSTRACT. Franchignoni F, Orlandini D, Ferriero G, Moscato TA. Reliability, validity, and responsiveness of the Locomotor Capabilities Index in adults with lower-limb amputation undergoing prosthetic training. Arch Phys Med Rehabil 2004;85:743-8.

Objective: To assess the reliability, validity, and responsiveness of both the standard and revised Locomotor Capabilities Index (LCI) in people with lower-limb amputation who undergo prosthetic training.

Design: Reliability and validity study.

Setting: Two freestanding rehabilitation centers.

Participants: Fifty inpatients with a recent unilateral lower-limb amputation.

Interventions: Not applicable.

Main Outcome Measures: The standard LCI and a new version with a 5-level ordinal scale (LCI-5) were tested for internal consistency, test-retest reliability, ceiling effect, and effect size. The construct validity of both versions was analyzed by correlation with the Rivermead Mobility Index, a timed walking test, and the FIM instrument.

Results: The Cronbach α of both LCI versions was .95. The item-to-total correlations (Spearman ρ) ranged from .50 to .87 ($P<.0001$ for all). The percent agreement and κ values for the item scores ranged, respectively, from 78.4% to 100% and .58 to 1.00 in the LCI, and from 75.7% to 97.3% and .54 to .96 in the LCI-5. The intraclass correlation coefficient (model 2,1) for the total scores was .98 for both versions; the Bland-Altman plot revealed no systematic trend for either version. Both the LCI and LCI-5 correlated with all criterion measures (ρ range, .61–.76), with the LCI-5 showing a larger effect size during the rehabilitation period and a lower ceiling effect. Patients with transtibial amputation were more independent in performing activities than were those with transfemoral amputation; their locomotor capability negatively correlated with age.

Conclusions: Both the LCI and LCI-5 captured the global locomotor ability of people with lower-limb amputation during prosthetic training. The new LCI-5 presents similar and sometimes better psychometric properties than the standard LCI.

Key Words: Amputation; Leg prosthesis; Outcome assessment; Psychometrics; Rehabilitation.

MOBILITY IS A BASIC physical need, and its best possible restoration represents an important goal of rehabilitation programs after amputation of lower limbs.[1,2] To accurately monitor the impact of therapeutic interventions, particularly of prosthetic trials, there is a great need for simple and appropriate outcome measures of prosthetic mobility in people with lower-limb amputation.[1,3,4] In recent years a new instrument, the Locomotor Capabilities Index (LCI), has been proposed to evaluate ambulatory skills with a prosthesis, as part (item 11) of the Prosthetic Profile of the Amputee[5] (PPA), a questionnaire for people with lower-limb amputation. The LCI assesses a patient's perceived capability to perform 14 different locomotor activities while wearing a prosthesis; each item is scored on a 4-level ordinal scale.[6] Some results of studies with patients who were interviewed 6 months to 5 years after rehabilitation demonstrated the LCI's test-retest reliability,[7,8] internal consistency,[6] and construct validity[7-9] but showed a high ceiling effect.[8]

The aims of this study were (1) to investigate the main psychometric properties of the LCI when used with patients undergoing prosthetic training within 1 year after lower-limb amputation in order to provide complementary information about the LCI's clinical usefulness in a different context and population and (2) to compare these results with results of a new 5-level version of the scale (LCI-5) devised to improve the instrument's ability to discriminate between patients (and its responsiveness) and to reduce its ceiling effect. For this reason, the upper ordinal level of each LCI item (denoting the ability to accomplish activities alone) was split in the LCI-5 into 2 levels of increasing difficulty in performing each task, according to the use or nonuse of ambulation aids.

METHODS

Participants

Fifty patients (37 men, 13 women), who consecutively underwent (from January 1 to June 30, 2001) prosthetic training after a recent (<1y) unilateral lower-limb amputation at 2 freestanding rehabilitation centers, took part in the study. Before admission, they were screened for rehabilitation potential by physicians of the centers. Their median age was 51 years (interquartile range [IQR], 38–62y; range: 21–86y). Patients had amputations at either the transfemoral (60%) or transtibial (40%) level as a result of trauma (58%), peripheral vascular disease (32%), and other causes (10%), such as tumors and infection. The median time interval between amputation and prosthetic fitting was 7 months (IQR, 6–9mo). The program consisted of prosthetic fitting (permanent prosthesis), instruction in skin care and prosthetic management, muscle strengthening and stretching exercises (where appropriate), gait training, and functional training. The study was approved by the local ethics committee. All patients signed an informed consent before entering the study.

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Table 1: The LCI With Items Graded on a 5-Level Ordinal Scale (LCI-5)

The common question is "Whether or not you wear your prosthesis at the present time, would you say that you are able to do the following activities with your prosthesis on?"	No (0)	Yes, If Someone Helps Me (1)	Yes, If Someone Is Near Me (2)	Yes, Alone, With Ambulation Aids (3)	Yes, Alone, Without Ambulation Aids (4)
1. Get up from a chair	☐	☐	☐	☐	☐
2. Pick up an object from the floor when you are standing up with your prosthesis	☐	☐	☐	☐	☐
3. Get up from the floor (eg, if you fell)	☐	☐	☐	☐	☐
4. Walk in the house	☐	☐	☐	☐	☐
5. Walk outside on even ground	☐	☐	☐	☐	☐
6. Walk outside on uneven ground (eg, grass, gravel, slope)	☐	☐	☐	☐	☐
7. Walk outside in inclement weather (eg, snow, rain, ice)	☐	☐	☐	☐	☐
8. Go up the stairs with a hand-rail	☐	☐	☐	☐	☐
9. Go down the stairs with a hand-rail	☐	☐	☐	☐	☐
10. Step up a sidewalk curb	☐	☐	☐	☐	☐
11. Step down a sidewalk curb	☐	☐	☐	☐	☐
12. Go up a few steps (stairs) without a hand-rail	☐	☐	☐	☐	☐
13. Go down a few steps (stairs) without a hand-rail	☐	☐	☐	☐	☐
14. Walk while carrying an object	☐	☐	☐	☐	☐

NOTE. In the standard LCI,[6,9] items are scored according to a 4-level ordinal scale: the LCI-5 levels 3 and 4 are merged in a unique level (3, yes, alone).

Instruments and Procedure

Locomotor Capabilities Index. The LCI is a self-administered scale designed for people with lower-limb amputation. It is composed of 14 questions (phrased as "Would you say that you are able to do the following activities with your prosthesis on?") about different locomotor activities and selected primarily from the locomotor disabilities classification of the World Health Organization.[6] A 4-level ordinal scale (0–3 points; ranging from "not able" to "able to accomplish the activity alone") scores the degree of a person's perceived independence in performing each of the 14 activities while wearing the prosthesis. A composite measure representing the global locomotor ability level is obtained by adding the individual scores assigned to each activity, for a possible maximum score of 42. The LCI can be divided into two 7-item subscales that cover basic (items 1, 4, 5, 8–11) and advanced (items 2, 3, 6, 7, 12–14) activities, respectively[6,8] (table 1). Higher scores reflect greater locomotor capabilities with the prosthesis and less dependence on assistance. In this study, a physical therapist also asked each patient if every LCI activity he/she scored as having been accomplished alone (3 points) was performed with or without ambulation aids (canes, crutches, walkers). This allowed us to fill in a new 5-level version of the index, LCI-5. The LCI-5 splits the upper ordinal level of each item, "Yes, able to accomplish the activity alone" into "Yes, . . . alone with ambulation aids" (score: 3 points) and "Yes, . . . alone without ambulation aids" (score: 4 points), with a possible maximum score of 56 (table 1).

Rivermead Mobility Index. The Rivermead Mobility Index[10] (RMI) includes 15 mobility items: 14 are questions asked directly of the patient, while 1 question ("standing unsupported") relates to an observed performance. Dichotomous yes-no answers are scored 1 or 0 and then summed; hence, the cumulative score may range from 0 to 15, with a higher score indicating better patient mobility. The scale, developed for neurologically impaired patients, has been used in many pathologies to assess mobility changes related to rehabilitation treatment,[11] including lower-limb amputation.[12,13]

Timed walking test. The timed walking test[14,15] (TWT) assesses the time needed by patients to walk 10m on a level path in a straight line, using their own walking aid, if any, and at their own preferred speed. The time taken from the "go" order to complete the 10-m walk is measured (in seconds) with a stopwatch. The mean of 2 consecutive trials was considered in our study.

FIM instrument. The FIM instrument[16] is an ordinal scale composed of 18 items with 7 levels, ranging from 1 (total dependence) to 7 (total independence), designed to determine the level of disability of patients as reflected by their need for assistance and/or aids during activities of daily living (ADLs). The total FIM score has a range of 18 to 126, with lower scores denoting poorer performance. The FIM was developed to measure independent functioning in patients with multiple disabilities and has been used to assess lower-limb amputees.[17-19]

The LCI (and LCI-5), RMI, and FIM were simultaneously administered within the first 72 hours after admission (T_0) to the rehabilitation centers. The TWT was administered as soon as the patient began to walk outside of the parallel bars with the prosthesis (T_1). All tests were readministered at the end of the rehabilitation program (T_2).

Italian versions of the LCI and RMI were produced according to the procedure of cross-cultural translation and adaptation,[20] without any particular semantic difficulty being found. A validated Italian version of the FIM was adopted.[21]

Statistical Analysis

The internal consistency of both LCI and LCI-5 items at T_2 was analyzed calculating (1) Cronbach coefficient α and (2) the Spearman rank-correlation coefficients (ρ), to examine to what

Table 2: Distribution of the LCI Scores, at T_0 and T_2, Grouped and Divided by Amputation Level

	Total Sample (N=50)	Transfemoral (n=30)	Transtibial (n=20)	*z* and *P* Values*
LCI: T_0	18 (4.75–36)	14 (3–26.5)	31 (9–40.5)	$z=-2.31$, $P=.020$
LCI basic: T_0	12 (3–21)	11 (3–17)	18 (4.5–21)	$z=-1.85$, $P=.064$
LCI advanced: T_0	6 (1–15)	3 (0–9.5)	13 (4–19.5)	$z=-2.86$, $P=.004$
LCI: T_2	41 (32.7–42)	40 (25.5–42)	42 (38.5–42)	$z=-1.98$, $P=.047$
LCI basic: T_2	21 (21–21)	21 (18–21)	21 (21–21)	$z=-3.23$, $P=.001$
LCI advanced: T_2	20 (12.5–21)	19 (5.5–21)	21 (17.5–21)	$z=-1.94$, $P=.052$

NOTE. Values are median (IQR).
*Observed differences between transfemoral and transtibial groups (Mann-Whitney *U*).

degree each item correlated with the scale total omitting that item from the total (item-to-total correlation).[22]

To assess the test-retest reliability, 37 patients randomly selected from the total sample (mean LCI score, 37; range, 3–52) were asked to complete, once a day for 2 consecutive days, both the standard 4-level LCI (morning) and the LCI-5 (afternoon). The percent agreement and κ statistic for item scores, the intraclass correlation coefficient ($ICC_{2,1}$) and the Bland-Altman plot for total scores were calculated for each version.[23] Moreover, the correlation between the 2 scores (LCI, LCI-5) was computed with Spearman ρ, corrected for ties.

To provide evidence of construct validity, we tested our hypothesis that the locomotor ability (both LCI and LCI-5 scores) would be (1) correlated, in descending order, with a mobility index (RMI), a short-distance walking test (TWT), and a measure of independence in basic daily activities (FIM); and (2) higher in transtibial amputees than in transfemoral ones, and negatively correlated with age, considering that the level of amputation and aging are factors that correlate with functional capacity after lower-limb amputation.[4,24,25] Correlations were calculated with Spearman ρ, corrected for ties, and the Mann-Whitney *U* test was used to analyze differences between transtibial and transfemoral amputees.[23] The 5% significance level was adopted for hypotheses testing.

The responsiveness of the LCI and LCI-5 (ie, the ability to detect change over time) was determined as follows: (1) by using the Wilcoxon signed-rank procedure to analyze the difference in LCI scores during the testing period; (2) by calculating the effect size of LCI, defined as mean change score (T_2–T_0), divided by the standard deviation (SD) of the T_0 (admission) scores.[26] Values below 0.4 are considered small, values from 0.5 to 0.7 are considered moderate, and values of 0.8 or higher are considered high.[23(p105)]

RESULTS

The median duration of training was 36 days (IQR, 25–45d), and the median interval between admission (T_0) and when the patient began to walk outside of the parallel bars (T_1) was 14 days (IQR, 9–19d). The mean completion time of the LCI (self-administered) ± SD was 6.5±2 minutes, which included instructions and explanations by the staff. All questionnaires were fully completed; on occasion, patients found some minor difficulties in estimating capability for activities never performed with the prosthesis.

Table 2 presents the distribution of the LCI scores (total, LCI basic, LCI advanced) at T_0 and T_2, both grouped and divided by amputation level. The correlation between the 2 subscales of the LCI (LCI basic, LCI advanced) ranged from ρ equal to .77 (T_2) to ρ equal to .86 (T_0). One patient at admission and 23 at T_2 scored at the top in the LCI, whereas—according to the patient interview done by a physical therapist for compilation of the LCI-5—only 11 said they could accomplish all 14 activities in the LCI without aids at T_2. The median scores (and IQRs) of the other tests were as follows: at T_0, the LCI-5 was 19 (6–39), FIM was 121 (117–123), and RMI was 12.5 (9–13); at T_2, the LCI-5 was 50 (37.5–55), FIM was 121 (119–123), and RMI was 13.5 (12–14). The TWT was 21 seconds (15.5–37.5s) at T_1 and 13.75 seconds (9–27s) at T_2.

The Cronbach coefficient α was .95 for the LCI and LCI-5. The item-to-total correlation coefficients (ρ) ranged from .50 (LCI item 1, "get up from a chair") to .87 (LCI and LCI-5 item 6, "walk outside on uneven ground") ($P\leq.0001$ for all items considered).

The percent agreement and κ values for the item scores ranged, respectively, from 78.4% and .58 (item 6) to 100% and 1% (item 9) in the LCI, and from 75.7% and .54 to .64 (items 1, 7, 12) to 97.3% and .96 (item 11) in the LCI-5. The ICC for the total scores was .984 for the LCI and LCI-5. The repeated-measures analysis of variance did not reveal any significant difference between the corresponding scores at the 2 examination times for either version. The Bland-Altman plot showed that the means of the differences were 0.189±1.596 and 0.568±1.908 for LCI and LCI-5, respectively. Only 2 measurements were outside the 95% limits of agreement, for both LCI and LCI-5. The distribution of the differences was homogenous across the score range, with no systematic trend (LCI: $\rho=.11$; LCI-5: $\rho=-.083$).

The correlation between LCI and LCI-5 total scores ranged from *r* equal to .89 (T_1) to ρ equal to .994 (T_0). The relationships among variables at the basal examination are shown in table 3. The basal scores of LCI and LCI-5 showed a high correlation with the corresponding scores at T_2 (LCI: $\rho=.765$; LCI-5: $\rho=.788$; $P\leq.0001$ for both). The LCI and LCI-5 at T_0 also significantly correlated (for all, $P\leq.0001$) with all the other measures at T_2: TWT (LCI: $\rho=-.667$; LCI-5: $\rho=-.708$), RMI (LCI: $\rho=.752$; LCI-5: $\rho=.757$), and FIM (LCI: $\rho=.617$; LCI-5: $\rho=.622$).

The transtibial group was more independent in performing locomotor activities (LCI values) than the transfemoral group, with significant differences in most cases (table 2). Similar results (not shown) were found with the LCI-5. Furthermore,

Table 3: Correlation Among Variables at the Basal Examination

	LCI	LCI-5	RMI
LCI	—		
LCI-5	.994	—	
RMI	.735	.746	—
FIM	.612	.618	.623

NOTE. For all, $P\leq.0001$.

the transtibial group showed a higher gait speed than the transfemoral group at both examination times (median values of TWT: 15.5s vs 32s at T_1, $z=-4.49$, $P=.0001$; 9s vs 24.5s at T_2, $z=-4.44$, $P=.0001$), whereas the 2 amputation levels did not differ in RMI and FIM scores. Age significantly correlated with LCI ($\rho=-.554$ at T_0, $\rho=-.673$ at T_2; $P\leq.0001$ for both), LCI-5 ($\rho=-.557$ at T_0, $\rho=-.678$ at T_2; $P\leq.0001$ for both), and TWT ($\rho=.59$ at T_1, $\rho=.67$ at T_2; $P\leq.0001$ for both).

Both LCI and LCI-5 scores increased significantly during the test period (LCI: $z=-5.84$; LCI-5: $z=-6.09$; $P\leq.0001$ for both); the effect size was 1.09 for LCI (ie, 16.2/14.8), and 1.40 for LCI-5 (ie, 22.3/15.9).

DISCUSSION

Improved mobility can foster functional independence of people with lower-limb amputation in all activities of personal care and daily living and enhance their quality of life[2,4] (QOL). Several instruments have been used to assess mobility in such patients, but there is no agreement on what should be measured and what should be used to obtain this information.[1,3] Among discrete measures of mobility there are functional categorizations of ambulation (usually based on the amount of personal assistance needed and the type of aids used), and multi-item ordinal scales.[1] In addition to determining acceptable levels of reliability and validity for the aims of a particular trial, it is increasingly recognized that some pragmatic issues have to be considered in selecting an outcome measure. Specific measures designed to contain many items relevant to patients with a particular condition are more likely to reflect clinically important changes than are generic measures.[27] The acceptability of an instrument (respondent burden) and its ease of administering and processing (administrative burden) are important complementary factors to be weighed; thus, the measure should show an appropriate balance between its detail and accuracy (precision) and the effort required to collect data.[28]

The LCI is a disease-specific, self-administered instrument for assessing locomotor abilities generally considered essential for basic and advanced ADLs of people with lower-limb amputation and an enabling factor associated with long-term prosthetic use.[9] It is easily administered and quickly completed. A possible improvement would be the addition of some guidelines for item scoring (eg, "carrying an object").

Previous studies on the psychometric characteristics of the LCI were based on follow-up data gathered a considerable time after rehabilitation (up to 5y).[6-9] In contrast, our study provides the first results of its use with patients who undergo prosthetic training within 1 year of lower-limb amputation. This information can help clinicians be more confident about the appropriate use of the LCI in different populations and clinical settings.

The demographic and clinical characteristics of our sample (younger and with a high percentage of traumatic amputations at transtibial level) explain the LCI values that are higher than those reported in previous studies.[6-9] The difficulty order of the items is consistent with that presented by Gauthier-Gagnon et al.[9] The 3 activities most frequently performed alone at discharge were (in descending order of easiness): item 1 ("get up from a chair"), item 4 ("walk in the house"), and item 5 ("walk outside on even ground"), whereas the most difficult were (in ascending order of difficulty): item 7 ("walk outside in inclement weather"), item 12 ("go up a few steps without a handrail"), and item 13 ("go down a few steps without a hand-rail").

Twenty-three of the 50 patients (46%) showed LCI top scores at T_2, and a similar high ceiling effect was previously reported by others.[8,29] The skewed scores represent the limited ability of the instrument to distinguish among various grades of excellence and to detect improvements.[28,30] To counteract this bias, we recorded the use of ambulation aids in every activity in the LCI scored as performed alone, showing that the LCI-5 (see Methods) greatly reduces the percentage of top scores at discharge (by more than one half) and increases the variability detected in the patients' performances. The distinction between independence with or without ambulation aids was judged as valuable, according to the most used functional categorization of walking ability in people with lower-limb amputation,[1] and also considering that aids of this type greatly impair the upper-limb function in many everyday activities.

As for test-retest reliability, both the LCI and LCI-5 showed a high degree of correspondence and agreement (ICC values) between their total scores, and the Bland-Altman plot confirmed the good reproducibility of both the versions. This implies that repeated measurements would yield consistent total scores when the patient's status remains the same, making them informative even at the individual level (ie, in clinical decision making). The shorter time span between trials (1d vs 4wk) probably contributed to the higher reliability levels of the LCI that we found, compared with previous studies.[8,31] The percent agreement and κ values indicate substantial to excellent levels of agreement for almost all of the item scores.[23] This item reliability was slightly inferior in LCI-5 than in LCI, which is logical given the increase in the number of categories from 4 to 5; the considerable measurement error in the numeric value of a number of single items, however, allows only a group-level interpretation of the scores.

In line with the follow-up studies previously reported,[7-9] the elevated homogeneity of the LCI (Cronbach $\alpha=.95$, high item-to-total correlations) confirms that all the items concur in measuring a unique underlying construct. The same applies for the new LCI-5.

The items with the highest intercorrelations (ie, the item pairs 8–9, 10–11, 12–13, exploring the same task in "up" and "down" direction and showing $\rho>.90$), even if presenting some degree of redundancy,[22(p45)] provided (in the opinion of our teams) relevant clinical information for identifying specific areas for rehabilitation treatment and technical intervention. This face validity reinforces the content validity of the scale, preliminarily determined by a multidisciplinary group of Canadian health professionals.[6]

The convergence of LCI and LCI-5 scores at admission with a mobility index (RMI), a short-distance walking test (TWT), and a measure of patient independence of external help in basic ADLs (FIM) (taken both at the same time and at T_2) strengthens the validity of both versions as tools for measuring the prosthetic mobility of people with lower-limb amputation and predicting future functional abilities.

In previous studies,[12,14,17,19] each of the 3 other measures (RMI, TWT, FIM) provided valuable insights into the functional assessment of patients after lower-extremity amputation, but showed some limitation. For the RMI, further steps should be considered to improve its item selection, response format, and scaling properties.[13] The index seems at present to be more useful for epidemiologic studies than for everyday clinical application with single patients, where the identification of specific areas for treatment and a more precise monitoring of the intervention results are required. The TWT was judged not as an appropriate instrument to ascertain the global functional status, but as a complementary outcome measure in people with lower-limb amputation.[15] The FIM is a comprehensive instrument designed to measure independent functioning in 6 areas of basic self-care skills in a variety of disabling conditions; in people with lower-limb amputation, it generally presents very high scores, which greatly reduces its general appropriateness for monitoring mobility in such a population.[17-19]

A previous study[9] also demonstrated that the LCI scores correlate with frequency of prosthetic wear and active use of the prosthesis for locomotor activities in the house and outside and explain a significant percentage of variance in many variables related to prosthetic use. Longitudinal studies would be necessary to evaluate whether the LCI scores collected during prosthetic training can also predict the long-term use of the prosthesis.

Both LCI and LCI-5 could discriminate between groups of patients with lower-limb amputation at different levels (the locomotor capacity was greater in our transtibial amputees than in our transfemoral ones) and could reveal the negative effect of aging on ambulatory status when using a prosthesis. This confirmed our prior hypothesis and is in agreement with other reports.[9,29] This discriminative ability is an important feature, shared by some other disease-specific mobility scales (Prosthesis Evaluation Questionnaire [PEQ] mobility scale, Houghton scale)[8] but not by either the Barthel Index[29] or the FIM—2 functional status measures—nor by the RMI, a mobility scale with too few scoring levels to allow for a precise estimate of the capability of an individual patient.[13]

Overall, these findings suggest that both LCI versions can capture and monitor the global locomotor ability of people with lower-limb amputation while wearing a prosthesis, both during prosthetic training and at follow-up. Moreover, in a recent study of the psychometric properties, the LCI compared favorably with the Houghton scale[32] and a new measure based on the ambulation and transfer items of the PEQ.[7] The LCI-5 presents psychometric properties similar to the original version but has a lower ceiling effect and a larger effect size; this represents a greater ability to encompass the actual mobility range of subjects with lower-limb amputation who undergo prosthetic training, and to detect changes in functional limitations during rehabilitation programs.

A characteristic of the LCI and LCI-5 is that the instruments measure the perceived capability (what an individual thinks he/she could do in a hypothetical or standard situation) and not the performance (what an individual actually does in everyday life); this may be better for determining early the type and course of therapeutic interventions (with the advantages and limitations commonly related to patient-based measures),[28(p16-18)] but if assessment of the patient's function in the community is needed, performance measures are recommended.[33] As Miller et al[8] stated, further study is required to determine (1) if differences exist between capability and performance in people with lower-limb amputation and (2) what the magnitude of those differences may be.

For a comprehensive evaluation of the actual use of prosthetics used by persons with amputations, the factors that predispose and reinforce their use, and user's global mobility, we suggest instruments such as the PPA[5,7] or Trinity Amputation and Prosthesis Experience Scales.[34] Furthermore, an overall assessment of people with lower-limb amputation should also examine other parameters, such as independence in ADLs, reintegration into the community, and QOL.[3,4,35]

CONCLUSIONS

Care should be taken in generalizing these results, because the sample size was small and represented a highly select population—younger and with more amputees at transtibial level and/or of traumatic origin than in the general population with lower-limb amputation, but ideal for studying the ceiling effect of the scale. Nevertheless, our findings related to the LCI are fully in line with the results of other studies, conducted in different countries and contexts using the same instrument, [8,9,19,29] that support use of this index as an effective measure of locomotor capabilities in people with lower-limb amputation who wear a prosthesis. Finally, the preliminary results on the use of the LCI-5 are encouraging and support further investigations of the psychometric and practical characteristics of this revised version to confirm it as a constructive refinement of the instrument.

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