develop a French version of this questionnaire (PEQ-F) and to assess its psychometric properties.
Material and method International recommendations for translation and cross-cultural validation of questionnaires were followed. Fifty-two subjects (age 53 ± 16, 40 males/12 females, 28/12/12 trans-tibial-gritti-stokes/transfemoral, 21/28/3 ischemic/traumatic/other, years since amputation 10 ± 10) participated. Criterion validity was assessed with the Pearson Correlation Coefficient (PCC) between PEQ-F and other constructs (SF-36, Prosthetic-Profile-of-the Amputee-Locomotor-Capabilities-Index, Amputation-Body-Image-Scale, Brief-Pain-Inventory, Trinity-Amputation-and-Prosthesis-Experience-Scales-Revised, Activities-specific-Balance-Confidence-Scale, Timed Up and Go and 2 minutes Walking Tests). Internal consistency was assessed with the α-Cronbach Coefficient (α) and reliability with the Intra-class Correlation Coefficient (ICC) in 48 subjects who completed the questionnaire twice in a 7-day interval.
Results PEQ-F scores ranged 46–96/100 (76 ± 11). Criterion validity was verified for the PEQ-F (r = 0.38–0.33, P = 0.008–0.03) and for all tested subscales (r = 0.32–0.50, P = 0.02–0.0002). Internal consistency was satisfactory (α = 0.87). The reliability of the global PEQ-F was excellent (ICC = 0.89[0.82–0.93]), and good to excellent for its subscales (ICC ranging 0.60[0.37–0.75]–0.89[0.82–0.94]). There were no floor or ceiling effect.
Conclusion The French version of the PEQ-F has good psychometric properties, comparable to its original version. It offers a holistic evaluation that helps managing LLA patients and identifying personal needs. We promote the use of the whole questionnaire or part of it for both clinical and research purposes.
Disclosure of interest The authors declare that they have no competing interest.

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Effect of postoperative ambulation level on the quality of life in a trans-tibial amputee

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Introduction/Background Quality of life of a trans-tibial (TT) amputee is not only determined by his functional rehabilitation but also social, economical and psychological rehabilitation. A number of studies have analyzed the influence of lower limb amputation on these factors. This study analysed the effect of functional recovery on other parameters of quality of life in a TT amputee.
Material and method This was a 10 years retrospective and 2 years prospective study. A total of 160 patients of trans-tibial amputation were followed. Their postoperative ambulatory status was calculated using Pinzur's ambulatory level. Their quality of life was determined on the basis of answers to a five-point questionnaire, which included their social, economic and psychological aspects. These parameters were correlated to assess the influence of functional recovery on the quality of life.
Results All the amputees with Pinzur's 0–1 level of ambulation suffered loss of income consequent to loss of job. All of them felt increased level of depression and anxiety after amputation. Fifty percent of the patients with postoperative 0–1 level of ambulation felt socially neglected. Comparatively much less percentage of amputees with 5–6 level of ambulation suffered economic, social and psychological crisis.
Conclusion Quality of life of a TT amputee is determined not only by his functional rehabilitation but also social, economical and psychological factors. From this study we concluded that postoperative functional outcome significantly affects the quality of life of an amputee. An amputee with better ambulation level fares better economically, psychologically and socially in comparison to an amputee with poor ambulatory outcome.
Disclosure of interest The author declares that he has no competing interest.

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Importance of tying the sciatic nerve in above knee amputation to prevent neuroma formation

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Introduction/Background Sciatic nerve is the thickest nerve in human body. Neural sheath of sciatic nerve is rich in microvasculature. In this study we compared neuroma formation after tying the sciatic nerve with leaving its cut end open in patients who undergo above knee amputation.
Material and method In this study, we followed a total of 90 patients who underwent above knee amputation. In half of these patients, cut end of sciatic nerve was left open and in other half, the nerve was tied. Patients in both the groups were age, sex and BMI matched. Neuroma formation in the stump was assessed one year after surgery. This assessment was done by measuring the diameter of sciatic nerve ending using sonogram. Sciatic nerve diameter was measured bilaterally at the same level, and the value of the normal limb was taken as control.
Results Out of 45 patients who underwent tying of sciatic nerve, only 10 patients developed thickening of the cut end of sciatic nerve in comparison to opposite limb. On the other hand, 45 patients in whom the cut end was left open, 33 patients developed neuroma formation. This result was statistically significant.
Conclusion Rich microvascularity of sciatic nerve results in the formation of haematoma beneath the cut end, if it is left open. This haematoma eventually results in growth of neural fibres. As a result of this, neuroma formation occurs at cut end of sciatic nerve in above knee amputation. We thus conclude, it is always wise to tie the cut end of sciatic nerve in above knee amputation to prevent neuroma formation.
Disclosure of interest The author declares that he has no competing interest.

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Training of phantom limb movements in trans-humeral amputees increases mobilization capacity and associated residual muscle activation

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Introduction/Background In the light of the development of poly-digital hand prosthesis, we recently explored an intuitive control mode by surface EMG associated to phantom limb movements (PLM) in upper arm amputees (Jarrassé et al., 2017a, b). As little was known about PLM, we described types and characteristics of upper limb PLM and explored some factors potentially influencing these in a population of upper limb amputees (De Graaf et al.,

2016; Touillet et al., submitted). We showed, among others, that one persistent characteristic of PLM is the associated fatigue, which potentially is a problem when using PLM for prosthesis control since fatigue diminish the mobilization capacity as well as the stability of the EMG signals and thus interferes with the prosthesis control.

Material and method In the present study, we explored whether PLM training (not to confound with learning) can increase mobilization capacity and stabilize EMG signals. Five trans-humeral amputees volunteered for training of all their types of PLM at home on a daily basis during about 6 weeks. Kinematics (via the intact limb imitating the phantom movements) as well as EMG signals from the residual muscles were recorded just before and right after the training period.

Results None of the participants experienced (phantom or residual limb) pain related to the training. Three participants increased the number of different PLM they could execute. All of them increased the amplitude and velocity, and thus diminished the cycle duration, as well as the number of cycles they could execute before the PLM blocked by fatigue. The amplitude of the EMG increased and became more specific to the type of PLM.

Conclusion In conclusion, as is the case for intact limbs, training of PLM improves motor performance and stabilizes the EMG signals associated to PLM execution. This is encouraging for future PLM-based prosthesis control.

Keywords Phantom mobility; Training; Muscle activity

Disclosure of interest The authors declare that they have no competing interest.

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Barriers and facilitators for the implementation of clinical practice guidelines for the amputee: The perception of users

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Introduction/Background Efforts to produce high quality clinical practice guidelines (CPG) must be accompanied by implementation strategies aimed at eliminating specific barriers. With this study, we seek to identify the perceptions of the users of the CPG for the rehabilitation and care of individuals with lower limb amputation on the factors that facilitate or hinder its implementation.

Material and method A qualitative design was used. Semi-structured interviews were conducted with patients, health service providers and administrators of medium and high complexity organizations of the health system in Colombia. The transcribed interviews were coded to identify emerging categories based on the empirical findings. These were compared and complemented with the theoretical categories that resulted from the review of the literature.

Results In the analysis of the 38 interviews the perceived barriers were: Categories related to the patient, such as clinical and sociodemographic aspects (e.g., low economic resources, comorbidities and reduced mobility); access to services (e.g., residence in rural areas) and the type of social security affiliation. Categories related to the professionals, such as knowledge and competences (e.g., variability in academic training programs), experience with the amputated patient and communication skills. Categories related to the health system, such as availability of resources, opportunity in the care, information systems, costs of the health services and changes in the regulations of the system. And categories related to the CPG, such as its usefulness, methodological rigor, flexibility and the characteristics of the developer group.

Conclusion We identified categories not included in the theoretical review, such as the type of affiliation to social security, the variability in academic training programs, the changes in the system's regulations and the usefulness of the CPG. These findings allow designing implementation strategies that respond better to the Colombian scenario.

Keywords Qualitative research; Clinical practice guidelines; Implementation

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The importance of somatosensory feedback for phantom limb mobility revealed by differences in phantom movement kinematics between above- and below-elbow amputees

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Introduction/Background After amputation, hand and wrist phantom limb movements (PLM) are experienced as effortfull, slower and smaller than healthy limb movements. Our hypothesis is that this is caused by the altered somatosensory feedback coming from the residual limb muscle contractions that are associated to PLM. If this is true, one can expect to find differences between below- and above-elbow amputees since the latter ones still have many muscles left that were involved in hand and wrist movements, such that the sensory feedback is close to that before the amputation. To test this hypothesis, we compared PLM kinematics between above- and below-elbow amputees.

Material and method Six above- and 8 below-elbow amputees performed phantom hand and wrist PLM. The kinematics of the PLM was indirectly obtained via the intact limb that synchronously mimicked the PLM at a comfortable velocity, using a Cyberglove for hand movements and an inertial measurement unit for wrist movements. For each patient and each type of PLM, we determined the number of executed cycles, the duration of the cycles and the velocity.

Results Our results show that after above-elbow amputation the number of different types of PLM was higher, PLM repetitions were more numerous before blocking caused by fatigue, cycle duration was shorter and velocity was higher.

Conclusion In conclusion, below-elbow amputees have more facilities for PLM execution (i.e., they perceive their PLM as faster and less tiring) than above-elbow amputees. This confirms our hypothesis that the more the somatosensory feedback is altered with respect to intact limb feedback, the slower and more effortfull are PLM.

Keywords Kinematics; Phantom mobility; Neuromuscular plasticity

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