weight gain; pain reduction; relaxation; increased alertness and learning; decreased stress, depression and anxiety levels; promoted deep sleep and improved immune system [2–4]. However, when evaluating term massage programs, it is noticed that there are no similar methodologies between studies. The purpose of this study is to review massage programs for newborn babies.
Materials and methods: This is a systematic review study. A literature search was conducted *via* three databases: PubMed, PEDro and Scielo using the search terms "Massage therapy"; "Infant massage"; "Baby massage"; "Full term"; "term babies"; "neonates", "newborn" and "Maternal support" or "Mother support". The inclusion criteria were: Studies published in English, Spanish or Portuguese; RCT studies; Quasi-experimental studies; Studies with massage program; Studies with term babies' samples; Studies published between 2009 and 2019. The exclusion criteria were studies with term "babies with congenital disease". A total of 62 papers were found and analysed by both authors. Fourteen met the criteria, 5 RCT's and 9 quasi experimental studies.
Results: Studies described 6 programs of infant massage to newborn babies. Ten studies described mothers applying term massage program, 3 applied by health professionals and 1 divided between health professionals when in hospital and by their mothers when babies were discharged. The most representative direction of massage was from head to feet. Majority of the studies used group strategy for teaching infant massage to mothers. Programs varied from 1–3 days twice a day for 15 mn to once a week between 30–60 mn during 4–8 weeks. Studies were scored by PEDro's scale and ranged from 2 to 7. Half of the studies obtained score 5.
Discussion and conclusion: We can conclude that 6 massage programs are described in literature; the majority is performed by babies' mothers and there is a wide variety concerning program duration and frequency. Studies outcomes showed effects both on newborn babies and mother–baby relationship. Infant massage programs seem to be an important group teaching strategy for new parents. However, more studies should be done in order to understand if newborn massage works, regardless of the program type.

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Modulation of ankle antagonist co-activation during the transition from upright standing to gait and to sit in post-stroke subjects

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ABSTRACT
Introduction: Antagonist co-activation represents a neuronal command for the modulation of muscle synergies with postural control purposes [1], probably assuming a key role in the characterisation of tonus dysfunction in post-stroke subjects. This study aims to evaluate the ankle antagonist co-activation during different functional tasks in post-stroke subjects.
Materials and methods: A cross-sectional study was performed in eight participants (age = 43.00 ± 10.63 years; median ± interquartile range) who had a subcortical ischaemic stroke in the middle cerebral artery territory for at least 6 months. The study was approved by the local ethics committee and implemented in a research centre. Antagonist co-activation between tibialis anterior (TA) and soleus (SOL) and between TA and gastrocnemius medialis (GM) of the ipsilesional (IPSI) and contralesional (CONTRA) limbs was calculated through electromyographic signals collected during upright standing and postural phases of gait initiation and stand-to-sit, according to the methods proposed by Ribeiro [2].
Results: The CONTRA limb presented decreased values in TA/SOL pair during upright standing and increased values in both muscle pairs during gait initiation compared to the IPSI limb (Table 1). No significant differences were found between tasks (Table 1).

Table 1. Median (Md) and interquartile range (IQR) of antagonist co-activation during functional tasks and p-values obtained from inter-limb and inter-task comparisons.

		Functional task						
		Upright standing		Gait initiation		Stand-to-sit		
Muscle pair	Limb	Md (IQR)	*p*-value	Md (IQR)	*p*-value	Md (IQR)	*p*-value	*p*-value
TA/SOL	IPSI	96.8 (38.8)	.039	71.1 (10.4)	.016	80.5 (15.5)	.250	.964
	CONTRA	50.9 (24.7)		100.9 (5.2)		94.1 (7.6)		.112
TA/GM	IPSI	88.9 (30.9)	.742	70.0 (7.6)	.016	77.0 (35.4)	.148	.964
	CONTRA	78.1 (20.9)		104.9 (1.7)		96.3 (4.9)		.305

Discussion and conclusions: The IPSI and CONTRA limbs presented increased antagonist co-activation when an adequate antigravity function and the coordination of the tibia forward rotation are required, respectively. The comparison of these values with that obtained by healthy subjects [3,4] seems to point to a bilateral postural control dysfunction in post-stroke subjects related to tonus modulation deficits that should be addressed in neurorehabilitation. Future studies with a higher sample are required to extend the results.

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On the potential of virtual reality for locomotion rehabilitation

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ABSTRACT

Introduction: In recent years, we have witnessed a growing number of people needing locomotion rehabilitation (e.g. stroke). The inability to walk has tremendous effects on the individuals' wellbeing and quality of life, making locomotion rehabilitation a vital component of physiotherapy. Virtual reality (VR), a term used to describe a technological system that creates a simulated world or environment, is a promising technology that has proven significant benefits in rehabilitation [1]. Our research goal is to help physiotherapists include VR in locomotion rehabilitations. In this work, we built an immersive VR system, Locomotiver, where users believe they are present in another specific environment. Locomotiver aim to support locomotion rehabilitation and fit physiotherapists' practices and patients' abilities, which included customisable exercises for lower limb recovery. These exercises mapped real ones from traditional interventions, also provide a very engaging and motivating experience for the users.

Materials and Methods: Locomotiver consists in a VR environment that can be used by therapists and patients, simultaneously. The patient experiences a 360° immersive environment using an HTC Vive headset and four trackers. Kondo et al. [2] inspired us to the minimalistic designed representation of the virtual body, representing the patients' head, hands, and feet in the virtual world. Furthermore, we did field research, where we observed the therapists working with several neurological and musculoskeletal patients and perform a variety of exercises related to their locomotion therapies. Also, based on formative series studies, we created three exercises ("Walking Forward", "Barriers" and "Zigzag"),