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Original articles

Electromyographic analysis of suprahyoid musculature before and after therapy taping in young women

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ABSTRACT

Purpose: to compare the effects of a tongue coupling program with and without therapy taping on suprahyoid muscles in young women.

Methods: participants were 14 women aged 19 to 25 years, allocated into two groups. The Experimental Group did 15-second tongue coupling in combination with tape use without tension, while the Control Group only did tongue coupling. Electromyography was used to analyze the suprahyoid muscles before, during, and after training, at rest, in maximum voluntary contraction, and in swallowing. The domains of amplitude and frequency of the electromyography signal were considered, in situations before, after and during the intervention, after which, the therapy taping appreciation questionnaire was administered. The chi-square test was used for clinical variables, Student's t-test, Wilcoxon test, and Mann-Whitney U test were used to compare before and after the intervention, and the Friedman ANOVA test was used for the training. The significance level was set at 5%.

Results: no statistically significant differences were found in muscle activity when comparing values before and after the intervention at rest and in swallowing in either group or between them. However, there was a general increase in maximum voluntary contraction in both regions, in both groups. There were positive impressions regarding tape use.

Conclusion: this approach in this population did not interfere with muscle activity, although there were positive qualitative results regarding the perception of the stimulated area.

Keywords: Electromyography; Myofunctional Therapy; Perception; Compression Bandages; Tongue

Study conducted at Universidade Federal de Santa Maria, Santa Maria, Rio Grande do Sul, Brasil.

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INTRODUCTION

Tongue coupling (TC) is an isometric exercise in which the tongue is coupled with the palate for a certain time, type of force, or pressure[1]. In speech-language-hearing clinical practice, this exercise has been included in various myofunctional therapy programs because it is potentially useful to activate the suprahyoid muscles[2-4].

Even though there are studies researching the effectiveness of oropharyngeal muscle strength exercises, few investigations address therapeutic approaches aiming to understand physiological implications and performance in therapeutic processes and muscle behavior in normal conditions[5].

Another aspect must be investigated and learned in depth in speech-language-hearing clinical practice, namely, the technical-scientific grounds regarding physiological parameters when choosing exercises and standardizing their doses. These variables also optimize therapeutic planning[6].

Establishing each exercise dose is an important component to obtain muscle conditioning and training results. However, the various speech-language-hearing training approaches in the literature lack a consensus on indications of frequency, duration, and intensity. There are various approaches concerning isometric exercises, ranging from once to seven times a week[7-9] with 5[10], 20[11], and up to 30 seconds of sustained contraction, in three series each[12].

As for TC, different approaches indicate three 10-second series, five times a week[13]; twenty-four 3-second repetitions, five times a week[9]; and up to thirty repetitions in the anterior and posterior tongue portions, not specifying the contraction time, in three series, three times a week[14].

Many principles to dose strength training in facial, masticatory, and swallowing muscle rehabilitation are based on the motor learning principles used in physical rehabilitation[15]. This area already has alternative investigations on interventions complementary to strength training exercises, which have been included in other interventions to aid them and obtain more effective rehabilitation processes – such is the case of therapy taping[16]. Different studies have addressed taping, investigating the benefits of applying it to the suprahyoid region in patients with cerebral palsy to control sialorrhea[16-18], in dysphagic patients[19], and in healthy patients' swallowing[13].

The present study used the Therapy Taping Method (Método Therapy Taping® – MTT®), developed by a Brazilian author, whose approach defines specific techniques for various dysfunctions of the oral-motor sensory system, proving to be a great therapeutic resource to treat oral-motor changes [16]. Although the literature suggests that the tape is effective, the specific action mechanisms and physiological effects are yet unknown, making it possible to ascribe the positive application results only to sensory and visual effects[20].

The assessment of muscle activation mechanisms with this exercise includes surface electromyography (EMG), which is a resource used in clinical practice and implemented in speech-language-hearing research[21]. This led to the idea of studying what happens in the suprahyoid muscles when MTT® sensory-perceptual stimuli are used to elicit motor responses, using more precise measuring instruments that help better understand activity changes in the target muscles.

Thus, this research aimed at comparing the effects of an exclusive TC program and associate it with MTT® on the suprahyoid muscles of young women. It considered the hypothesis that placing the tape on the region without tension, for a week, would generate muscle response variations.

METHODS

This experimental, quantitative, and prospective intervention study was approved by the Ethics Committee of the Federal University of Santa Maria, Brazil, under number 3.326.146 and CAAE number 11501419.4.0000.5346. All participants signed an informed consent form, and all ethical recommendations in Resolution 466/2012 were followed.

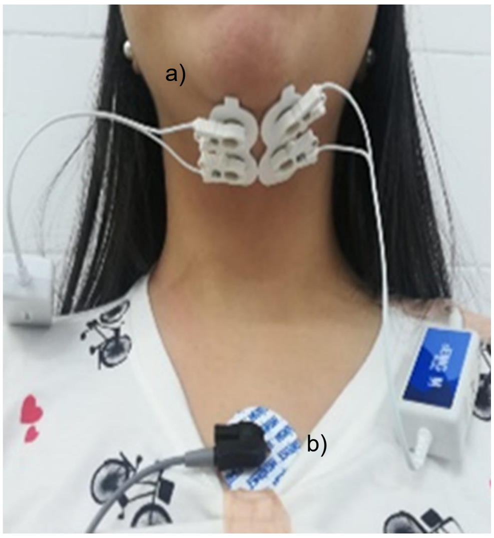
The convenience sample comprised 14 women aged 19 to 25 years; the research was publicized via e-mails and social media of the institution's Oral-Motor Function Laboratory. The inclusion criteria were females aged 18 to 35 years with no speech-language-hearing complaints related to oral-motor functions. The exclusion criteria were as follows: not being able to perform TC; having a body mass index (BMI) below 18.5 or above 24.9; having a history of speech-language-hearing treatment (within the previous year); having neuromuscular or hormonal disorders; having a history of head and neck surgery; having signs suggestive of neurological impairments and/or syndrome characteristics; having an allergic reaction to the tape (in the experimental group).

Initially, all participants answered a questionnaire based on the study selection criteria. They were also tested to verify whether they would have allergic reactions to the tape, by applying it to the inner forearm.

Volunteers that had no reactions were included in the study and submitted to speech-language-hearing clinical assessments and suprahyoid muscle EMG. The assessments encompassed an initial interview and a clinical examination of the stomatognathic system to investigate and complement questionnaire information. Both were conducted by the same researcher to better standardize them and minimize the collection bias. The history was based on the MBGR protocol[22] and the stomatognathic system was assessed with the Orofacial Myofunctional Evaluation Protocol with Scores (OMES-E)[23], complemented by the MBGR protocol[22] in aspects related to muscle tone and head posture. The following clinical assessment variables were relevant to the study: tongue posture at rest and in swallowing; tongue tone, mobility, and symmetry; head posture; masticatory pattern; swallowing; breathing mode.

EMG consisted of an instrumental assessment before and after the intervention, which picked up the electrical activity of the suprahyoid muscles at rest, in swallowing liquids, and in maximum voluntary contraction (MVC), as well as TC muscle training. At rest, 15 seconds were collected without swallowing or any other movement in the target region; in swallowing, the three central cycles of continuously ingesting 100 ml of water were considered; in MVC, the 5 central seconds of TC at maximum force were considered. Suprahyoid muscle training used TC exercises in three 15-second series[12,24]. The exercises were applied in three series because after the fourth series discomfort and fatigue may increase due to greater lactate production[6].

This assessment used double Ag/AgCl electrodes (*Hal Indústria e Comércio ltda.*) on the suprahyoid muscles and monopolar reference electrodes on the sternum (Figure 1). The EMG signal was picked up with Miotool (Miotec), with eight input channels, 14-bit resolution A/D converter, 5000-volt electric isolation, 2000-samples/second/channel maximum acquisition capacity, 1000-Hz scale amplification, common mode rejection rate > 100 dB, and high-pass and low-pass filters respectively of 20 Hz and 500 Hz. This instrument was attached to a portable computer manufactured by Itautec S.A., with an Intel Pentium processor and Windows 7 Pro operational system, not plugged into an electrical outlet to avoid its interference in the signal. The signal was analyzed with Miograph Swite software (Miotec). After collecting the signal in microvolts, it was normalized with MVC, as recommended by SENIAM[25]. Two spectra of the electromyographic signal, amplitude and frequency, were considered. The Amplitude domain was used for the pre, post and training analysis, while the Frequency domain was used to analyze the behavior of the median frequency during training, looking for signs of muscle fatigue.



Source: The authors

Figure 1. Electrodes fixed on the submandibular region; a) bipolar electrodes on the suprahyoid muscles; b) monopolar reference electrode on the sternum

After finishing the training, participants were randomly distributed into Experimental (EG) and Control Groups (CG). The EG had 15-second TC muscle training in three series, three times a day, for 1 week, combined with MTT® tape use, without tension, on the suprahyoid muscles. The CG only had the TC muscle training.

During the training week, participants were monitored and received a sheet to record in detail their training, checking the three series they were expected to perform three times a day. Also, a complementary reminder mechanism was established with the participants, who received daily messages to remind them to perform the series.

This study used beige tapes, named “skin color” by the therapy tape brand Therapy Tex®, which is used in MTT® for being more neutral and less visible. The “I” application technique was used, without tension between points A and B, on the skin over the mylohyoid muscle, in the suprahyoid region, following neck application criteria[16]. Hence, points “A” and “B” were identified on the skin in the region of the anterior belly of the digastric muscle and mylohyoid muscle, measuring the tape between these points to calculate its total length (Figure 2). The ends were round-shaped to make it less likely for the material to unstick or shred. Then, the submandibular skin was cleaned with a damp gauze with 70% alcohol, and the tape was applied after the skin had completely dried. After preparing the skin, the tape was cut into three equal parts. After removing the paper, the middle third of the tape was first applied to the skin, and then the ends were applied. The tape was rubbed over the skin to improve its adherence.

Source: The authors

Figure 2. Tape application technique to stimulate the skin over the suprahyoid muscles

Muscle training was conducted for 1 week in direct relation to one of the MTT® application phases, named the sensory phase. It lasts 1 week and is the basis of the whole process involving therapy taping, as it helps adapt to the material, stimulating without tensioning or stretching the skin. As there is no scientific evidence on the phase, it was important to verify the possibility of changing muscle activity only with somatosensory stimuli.

After the 7 continuous training days, the therapy tape was removed from EG participants, and then all volunteers were reassessed with EMG. Their perception of the therapeutic process was analyzed with a self-assessment on a visual analog scale. The EG also answered an MTT® appreciation questionnaire[26].

Data were saved on an Excel spreadsheet for later analysis. Initially, the Shapiro-Wilks test was used for the continuous numerical variables to verify their normality. Few of them did not have normal behavior; therefore, most selected tests were parametric.

The clinical characteristics of the sample were compared with the Chi-Square test. Pre-intervention and post-intervention variables within the groups were compared with Student’s dependent sample t-test and Wilcoxon test. Pre-intervention and post-intervention variables between the groups were compared with Student’s independent sample t-test and Mann-Whitney U test. Electrical activity performance in training was analyzed with the Friedman ANOVA test. A descriptive analysis was made for qualitative variables regarding tape application. The effect size was analyzed with Cohen’s D and Cohen’s f^2. The significance level was set at 5% for all tests.

It was also important to investigate the influence of the participants’ clinical experience and tongue tone on the outcomes, as these characteristics were observed in the sample. Hence, two complementary analyses were made, following the format of the original one.

RESULTS

The study sample had six participants (43%) in the EG and eight (57%) in the CG. Their age ranged from 19 to 25 years, with an overall mean age of 22 years. In the EG, the mean was of 21 years, while in the CG, it was of 22 years.

The clinical variables important to the objective of the research are presented in Table 1, per study group. Anatomical and functional aspects of the suprahyoid muscles in the sample were mostly normal, including dentofacial balance. It can be observed, through the application of the Chi-Square Test, that the EG and CG did not differ statistically regarding the initial clinical characteristics of the Stomatognathic System.

Table 1. Distribution of clinical variables per study group

Clinical variables			CG (N = 8)	EG (N = 6)	N	%	p-value*
TP at rest	Contained within the normal cavity		8	6	14	100	-
TP in swallowing	Normal		8	6	14	100	-
Tongue tone[&]	Normal		2	3	5	35.7	0.33
	Decreased		6	3	9	64.3	
Tongue mobility	Elevation	Normal	6	5	11	78.6	0.70
	Insufficient	2	1	3	21.4		
	R Lateralization	Normal	7	6	13	93	0.36
	Insufficient	1	0	1	7		
	L Lateralization	Normal	7	6	13	93	0.36
	Insufficient	1	0	1	7		
Tongue symmetry	Normal		8	6	14	100	-
Head posture[&]	Frontal	Normal	7	4	11	78.6	0.34
		L inclination	1	2	3	21.4	
	Lateral	Normal	5	6	11	78.6	0.09
		Anteriorized	3	0	3	21.4	
Swallowing	Normal		8	6	14	100	-
Masticatory pattern	Alternating bilaterally		6	5	11	78.6	0.70
	Unilateral preference**		2	1	3	21.4	
Breathing mode	Nasal		7	5	12	85.7	0.82
	Oronasal		1	1	2	14.3	

Captions: CG – control group; EG – experimental group; N – number of subjects; % - percentage of subjects; * - analysis with the chi-square test; TP – tongue posture; R – right; L – left; ** - Two participants preferred the right and one preferred the left; [&] - considered from the MBGR protocol.

Table 2 describes the data on the electrical activity of the right and left suprahyoid muscles at rest, in swallowing, and in MVC, before and after the intervention, in the CG and EG and between them. Through the appropriate statistical tests, statistical significance was observed only at the EG level, in one of the muscles, in the MVC.

Table 2. Comparison of the standardized electrical activity of the right and left suprahyoid muscles at rest, in swallowing, and in maximum voluntary contraction, before and after intervention in the study groups

Situations		Control Group						Experimental Group						p-value Pre	p-value Post	Cohen's *d* Post
		Pre-training		Post-training		p-value	Cohen's *d*	Pre-training		Post-training		p-value	Cohen's *d*			
		X	(SD)	X	(SD)			X	(SD)	X	(SD)					
RS	Rest	2.7	0.9	2.7	1.1	0.7[a]	0.02	3.9	3.3	3.9	3.1	0.9[a]	0	0.8[c]	1.0[c]	0.51
	Swallowing	26.0	15.0	24.8	16.4	0.6[b]	0.07	21.0	12.0	24.9	14.9	0.1[b]	0.28	0.6[d]	0.9[d]	0.006
	MVC	79.7	16.0	91.1	27.8	0.2[b]	0.47	83.1	14.0	105.2	21.4	0.02[b]*	1.17	0.8[d]	0.6[d]	0.56
LS	Rest	2.8	1.1	3.0	1.1	0.3[b]	0.18	3.5	2.0	4.2	2.8	0.3[b]	0.28	0.1[d]	0.8[c]	0.56
	Swallowing	30.2	21.7	25.3	15.6	0.4[b]	0.25	21.7	12.6	27.5	15.5	0.3[b]	0.40	0.4[c]	1.0[d]	0.14
	MVC	80.9	33.4	95.4	23.1	0.5[b]	0.48	75.3	31.0	86.9	31.2	0.5[b]	0.37	0.9[d]	0.5[d]	0.30

Captions: RS- right suprahyoid muscles; LS- left suprahyoid muscles; MVC- maximum voluntary contraction; X-mean; SD- standard deviation; a- Wilcoxon test; b- dependent sample t-test, * - statistical significance; c- Mann-Whitney U test; d- independent sample t-test.

The comparison of the data on electrical activity regarding amplitude and frequency of the right and left suprahyoid muscles in training in the CG and EG are respectively shown in Tables 3 and 4. Only at the level of amplitude, for the LS of the CG there was statistical significance throughout the training, which was not evidenced at the level of signal frequency.

Table 3. Comparison of the standardized electrical activity (amplitude domain) of the right and left suprahyoid muscles during training before and after intervention in the study groups

Muscle	Training	Control Group						Experimental Group					
		Pre-training		Post-training		p	Cohen's *d*	Pre-training		Post-training		p	Cohen's *d*
		X	(SD)	X	(SD)			X	(SD)	X	(SD)		
RS	1st cycle	29.6	14.4	28.7	22.4	0.8 [a]	0.04	33.8	12.0	29.1	15.3	0.4 [a]	0.33
	2nd cycle	34.5	15.1	27.3	18.5	0.2 [a]	0.42	37.3	14.5	30.7	17.5	0.5 [a]	0.40
	3rd cycle	33.0	13.9	32.5	18.5	0.9 [a]	0.02	36.8	18.4	27.9	11.4	0.4 [a]	0.55
p-value		0.1 [b]		0.2 [b]				0.6 [b]		0.5 [b]			
Cohen's f^2		0.14		0.11				0.10		0.08			
LS	1st cycle	25.8	8.0	29.6	20.1	0.5 [a]	0.23	29.2	12.0	29.0	23.9	1.0 [a]	0.009
	2nd cycle	29.8	8.0	29.9	18.2	1.0 [a]	0.006	32.7	18.1	32.6	29.6	1.0 [a]	0.003
	3rd cycle	28.3	5.2	37.5	20.4	0.2 [a]	0.50	34.9	28.1	28.4	21.0	0.7 [a]	0.25
p-value		0.4 [b]		0.02 [b]*				0.6 b		0.8 [b]			
Cohen's f^2		0.06		0.19				0.13		0.07			

Captions: RS- right suprahyoid muscles; LS- left suprahyoid muscles; X-mean; SD- standard deviation; a- dependent sample t-test; b- Friedman ANOVA test; c- independent sample t-test; d- Mann-Whitney U test.

Table 4. Comparison of the standardized electrical activity (frequency domain) of the right and left suprahyoid muscles during training before and after intervention in the study groups

Muscle	Training	Control Group				Experimental Group			
		Pre-training		Post-training		Pre-training		Post-training	
		X	(SD)	X	(SD)	X	(SD)	X	(SD)
RS	MF 1st cycle	163.8	15.8	161.9	21.0	147.1	17.3	163.2	22.3
	MF 2nd cycle	156.9	14.7	164.9	24.9	145.4	16.7	157.6	28.2
	MF 3rd cycle	154.1	14.5	158.0	20.2	148.6	20.4	160.5	27.4
p-value		0.1 [a]		0.2 [a]		0.60 [a]		0 .51 [a]	
Cohen's f^2		0.29		0.14		0.06		0.09	
LS	MF 1st cycle	167.1	17.4	157.8	27.1	156.4	26.5	162.2	24.7
	MF 2nd cycle	157.8	21.6	159.7	32.3	156.5	26.3	156.6	28.2
	MF 3rd cycle	153.6	21.0	154.9	28.3	165.9	41.3	159.4	28.9
p-value		0.14 [a]		0.4 [a]		0.5 [a]		0.1 [a]	
Cohen's f^2		0.21		0.06		0.13		0.08	

Captions: RS- right suprahyoid muscles; LS- left suprahyoid muscles; MF- median frequency; X- mean; SD- standard deviation; a- Friedman ANOVA test.

The distribution of the qualitative variables related to the participants' perception of therapy tape use is described in Table 5. In general, the impressions were positive regarding the use of the bandage.

The two complementary analyses of experience and tongue tone found no influence on the outcomes. As in the previous analyses, there were two exceptions, in which MVC increased on both sides of the suprahyoid region.

Table 5. Qualitative analysis distribution after tape use in absolute and percentage values

Variables of MTT® therapy tape appreciation			N	%
EG Visual Analog Scale		4	1	16.7
5		1	16.7	
6		2	33.3	
8		2	33.3	
CG Visual Analog Scale		4	2	25
6		3	35	
8		2	25	
10		1	15	
Overall comfort test		Extremely comfortable	1	16.7
Very comfortable		2	33.3	
Rather comfortable		2	33.3	
Comfortable		1	16.6	
Subjective Judgment Test	Color	Very comfortable	2	33.3
		Comfortable	3	50
		Somewhat uncomfortable	1	16.7
	Texture	Very comfortable	5	83.3
		Comfortable	1	16.7
	Application	Very comfortable	5	83.3
		Comfortable	1	16.7
	Time of application	Quick	5	83.33
		Adequate	1	16.7
	Positive changes	Yes	6	100
	Hygiene limitation	No	6	100

Captions: N- number of subjects; % - percentage of participating subjects.

DISCUSSION

Few studies have investigated the effects of therapy taping in healthy individuals in the region of interest of this study. Moreover, they often have inconsistent methodological criteria.

The study in the literature that came the closest to this approach was conducted in healthy adults[13]. Researchers compared suprahyoid muscle activation during the application of kinesio taping (KT) in tension levels of 50%, 80%, and without tension, with EMG analysis in the swallowing tests. They found greater electrical activity values when KT was applied in maximum tension. The difference between the present study and the literature, though both approached healthy subjects, is in that the present research did not compare the effect of different tensions, and the times defined by the authors were not described in the literature. Therefore, the results are probably related to application tensions and tape positioning.

In the analysis of clinical variables, only two participants were oronasal breathers, while the other 12 were nasal breathers (Table 1). Also, all participants had a normal tongue posture at rest and in swallowing, which may be related to their breathing mode and especially to the normal conditions of the sample[27].

Even though the said variables were normal, most participants had low tongue tone (64.3%) (Table 1). Despite this difference, tone condition was not enough to statistically interfere with the study outcome, at least with clinically relevant differences. This may be related to the brief intervention and the participants with this similar characteristic present in both groups.

This study also analyzed clinical variables regarding tongue mobility, head posture, and masticatory pattern, given the interaction between the craniocervical and craniomandibular systems and the suprahyoid muscle activity[28]. Tongue mobility results showed that only three volunteers had difficulties, two of them with head inclination. However, they were not the same volunteers that had unilateral mastication patterns. The two participants with this last condition had normal tongue mobility and head posture (Table 1). It is believed that interactions mentioned in the literature were not observed in this study because of the participants' normal conditions.

Both groups were homogeneous at the beginning of the training, and no response variations were found after 1 week. This suggests that using therapy taping on the suprahyoid region without tension as a complement to TC training did not result in muscle gain. On the other hand, there was statistical significance in MVC in the right suprahyoid muscle of the EG before and after the training.

The initial hypothesis was that applying therapy tape to the suprahyoid region as a complement to TC exercises could influence muscle activity responses. However, it was not confirmed, as both groups had similar results after the intervention.

Some authors point out that the therapy tape must necessarily generate a considerable force level on the skin surface to deform the tissue and obtain proprioceptive benefits[29]. This may suggest that this sensitivity approach (1 week of TC training and therapy tape applied with no tensions) did not make changes in the muscles after training, as it may not have been sensitive enough to change the electric activity in the target muscles.

In general, all muscles in the two groups (with two exceptions) increased the MVC. Hence, these results may be more related to the sample size than to a clinical condition, as the change occurred in different clinical contexts. Indeed, the Cohen analyses resulted in small effect sizes in most variables – which suggests that a larger sample would be necessary to obtain certain statistical significances. This research did not continue collection only because of the COVID-19 pandemic.

A study[21] demonstrated that the relationship between the results of the suprahyoid muscles' electrical activity in maximum tongue pressure tasks may be related to localization, number of activated muscles, and duration of muscle activation. The authors found, in healthy adults of both sexes, lower values in tongue elevation tasks than in tongue protrusion, depression, and elevation tasks. This suggests[30] that TC activates inner muscles, while surface EMG picks up the activity of outer muscles. Some authors report that the tongue is pressed against the palate mainly by the genioglossus muscle, with less participation of the suprahyoid muscles. However, since EMG investigation is more superficial, it mainly picks up the activity of the mylohyoid, geniohyoid, and anterior belly of the digastric muscle, while it minimally picks up that of the genioglossus, which may influence the values obtained from the suprahyoid muscles[29]. Therefore, further research must include new strategies or new instrument alternatives to assess inner muscles.

Despite the few studies approaching the physiological effects of tape use with EMG, most papers address the clinical and perceptual effects of tape application. The visual analog scale stands out among the strategies to assess and measure the outcomes.

Regarding the participants' perception of tape use (Table 5), this research found they had positive changes and impressions regarding the use of tape as a complementary therapeutic method. After using it for 1 week, EG participants reported increased perception in the target region, which may demonstrate the effectiveness of the purpose of the first phase (sensory phase) proposed by the author of the method. Using therapy tape in MTT® improves both tactile sensitivity and body awareness[26].

Concerning the EG participants' impressions, each person's adaptation and degree of tolerance to tape application were completely different, even with standardized methodological criteria and using the same stimuli. This aspect not only reinforces the importance of the sensory diet proposed by the author of the method but also suggests that these variables be analyzed in efforts to standardize and use therapy tape in the head and neck region – which is one of the most sensitive and delicate regions of the body.

Another hypothesis in this study was that by implementing the criteria suggested for isometric exercise programs for oropharyngeal muscles based on the physiology of the skeletal muscles of the body in general[31], greater electrical activities would be recorded after 1 week of training. However, even adjusting for these indications, this study did not find any increase in EMG records. This probably happened because the general principles of motor learning and strength training cannot be generalized to tongue muscles, in comparison with other skeletal muscles, because of the hybrid composition of the muscle fibers in the region studied.

A study further explains why no response changes were found with EMG assessment regarding the training time established. The authors suggest that physiological changes and consequently strength gain in oropharyngeal muscles occur after 4 and 6 weeks of training[13]. It must be pointed out that this aspect was considered and analyzed for the study, but the decision was to follow the training approach related to the first phase of MTT®, known as the sensory phase.

An important limitation of the study was the impossibility of blinding participants to obtain data, given the characteristics of the tape. Also, the small sample size may have influenced some variables, which was addressed with effect size analysis. It is important to emphasize the need for future studies with specific populations according to the underlying pathology, taking into account that the present study had difficulty in transposing results obtained with groups of healthy individuals to the practice with patients affected by different disorders.

CONCLUSION

Following the initial approach of the study, no statistically significant differences were verified, before and after training, in suprahyoid muscle activity in young women at rest, in swallowing, and in MVC, regardless of the type of intervention used. Neither did the training change between pre-intervention and post-intervention. Hence, three 15-second series of TC training, three times a day for 1 week, with tape application without tension on the target muscles of the study were not enough to change the muscle electrical activity in this population. However, the qualitative assessment demonstrated positive changes resulting from tape use, such as increased perception of the target area of the study.

Thus, positive responses about therapy tape and its use in young women indicate its potential and possible benefits that must be explored in different populations. Future studies should approach this therapeutic resource in men, other age groups, and in situations of oral-motor changes, assessing long-term effects with the same methodology used or variations in its application.

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