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Original Article
Artigo Original

The taping method effects on the trapezius muscle in healthy adults

Os efeitos da bandagem elástica no músculo trapézio em adultos saudáveis

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Keywords

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Electromyography
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ABSTRACT

Purpose: To verify the elastic therapeutic tape effects on the trapezius muscle in healthy adults, using data from surface electromyography and a self-reported questionnaire. **Methods:** A total of 51 across sex healthy adults were enrolled in this study, whose age range was 20 to 35 years.. The individuals were divided into three groups: G1, who wore the elastic therapeutic tape applied with tension; G2, who wore the elastic therapeutic tape applied with no tension; and G3, control group, who did not wear the elastic therapeutic tape. The elastic therapeutic tape was bilaterally applied on the trapezius muscle. For measuring results, surface electromyography signals were collected before, while and after the elastic therapeutic tape was worn, and a qualitative questionnaire was applied. **Results:** There were no significant differences in either pre- or post-electromyography findings within each group, or when groups were compared. When comparing G1 and G2 moments before and while the elastic therapeutic tape was worn, a statistically significant difference was noted during the maximum voluntary contraction variable on the individuals' left side. When answering the questionnaire, most individuals mentioned a relaxing feeling while wearing the elastic therapeutic tape. **Conclusion:** The individuals wearing the elastic therapeutic tape in this sample did not present any significant differences during the surface electromyography assessment. As for the questionnaire, most of the individuals investigated reported a relaxing feeling after wearing the elastic therapeutic tape.

Descritores

Fonoaudiologia
Eletromiografia
Sistema Musculoesquelético
Adulto
Sensação

RESUMO

Objetivo: Verificar o efeito da bandagem elástica no músculo trapézio, por meio da eletromiografia e de um questionário autorreferido em adultos saudáveis. **Método:** Participaram 51 adultos saudáveis, de ambos os sexos, na faixa etária entre 20 e 35 anos. Os sujeitos foram divididos em três grupos: G1, que utilizou a bandagem elástica com tensão; G2, que utilizou a bandagem elástica sem tensão; e G3, grupo controle, que não utilizou a bandagem. A aplicação da bandagem ocorreu no músculo trapézio, bilateralmente. Para a mensuração dos resultados, foram coletados sinais eletromiográficos antes, durante e depois do uso da bandagem, e foi aplicado um questionário qualitativo. **Resultados:** Não houve diferenças significativas nos achados eletromiográficos antes e depois do uso da bandagem, em cada grupo e na comparação entre os grupos. Na confrontação G1 com G2, nos momentos antes e durante o uso da bandagem, foi verificada uma diferença estatisticamente significante na variável contração voluntária máxima do lado esquerdo. No questionário, a maioria dos sujeitos relatou sensação de relaxamento com o uso da bandagem. **Conclusão:** Os sujeitos da amostra que utilizaram a bandagem não apresentaram diferenças estatisticamente significantes na eletromiografia. Em relação ao questionário, a maioria dos sujeitos pesquisados afirmou sensação de relaxamento após o uso da bandagem.

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INTRODUCTION

The elastic therapeutic tape is made of a therapeutic material consisting of spandex micro-strands wrapped in twisted cotton fibers, to which no medication is added. This material has been developed to adhere to the human skin over a long period, in order to stimulate the integumentary system[1,2].

The stimuli the bandage exerts on the integumentary system increase the feeling of the skin area and, therefore, promote the conduction of this information[1,3]. This path from the integumentary system to the somatosensory area of the cerebral cortex and the cerebellum occurs via the afferent pathway, which in turn triggers a motor response[3].

The Therapy Taping® method is used in the rehabilitation of musculoskeletal disorders, providing either an increase or a decrease in the neural excitation of the muscle, depending on the therapeutic purpose determined after the clinical assessment[1]. Numerous studies on the use of this method found in the literature are in physiotherapy, which show it is especially used for treating pain[4-6], in sports[7] and in neurology[8].

Using this material as a therapeutic resource in speech language therapy is recent. Studies on this topic were first published in 2009[9], proving the effectiveness of the elastic therapeutic tape to treat extraoral leak of saliva in 42 children with cerebral palsy. In this study, the elastic therapeutic tape was applied on the suprahyoid region for one month, reducing the frequency and severity of sialorrhea after the elastic therapeutic tape was worn.

In another research study[10], the use of the elastic therapeutic tape was also related to the improvement of sialorrhea. This study involved 11 children with neurological sequelae, who also wore the tape on the same muscle structure for one month. The authors noticed a reduction in the amount of sialorrhea, chocking and the number of towels used after the treatment, although these gains were not maintained after a three-month period.

Other authors also investigated[11] the biomechanical influence of the elastic therapeutic tape on the antero-lateral extrinsic muscles of the larynx in dysphonic individuals, as well as on their voice quality. As a method, the sample consisted of 30 dysphonic patients who were divided into two groups of 15 people: the first group was provided with traditional speech language therapy complemented with the taping method, whereas the second one was submitted only to traditional therapy (control group), and their voice was recorded before and after the treatment. The Voice Handicap Index (VHI) protocol was also applied. After the treatment, both groups achieved a statistically significant improvement in voice quality within the Jitter acoustic features and the noise-to-harmonic ratio in VHI; however, the research group also achieved improvement in their physical and emotional domains.

In another study[4] concerning speech-language therapy, researchers investigated the effect of the elastic therapeutic tape on pain and the range of the temporomandibular joint motion. The sample was composed of 42 individuals divided into research and control groups. The elastic therapeutic tape was applied on the sternocleidomastoid muscle of the individuals in the research group, three times a week, whereas no therapy was applied to the control group. One of the results obtained was that the research group showed statistically significant improvement in the pain intensity scale and mouth opening after a two-week intervention.

Clinical use of the elastic therapeutic tape has increased, and so has the investigation of its applicability and efficacy in the scientific community[1,3,10-12]. Using this material as an auxiliary therapeutic resource in alterations of orofacial motility, deglutition and phonation calls for further investigation involving different individuals and methods.

Since this is a recent therapeutic resource, understanding its effect on the muscles of healthy individuals may promote greater knowledge in its clinical use, besides better addressing research for individuals with disorders. Based on the clinical experience of the authors of this study, using the Therapy Taping® method will hypothetically produce some sort of effect on the muscle fibers in healthy individuals. Therefore, the research in this study aimed at verifying the elastic therapeutic tape effects on the trapezius muscle in healthy adults.

METHODS

This study was approved by the Research Ethics Committee of the university, under the CAAE number of 18557513.1.0000.5482. It is worth noting that the ethical principles have been fulfilled, as per Resolution 466 of 2012. The volunteers signed the Free and Informed Consent Term (FICT). This is a prospective observational study.

The sample consisted of 51 across sex healthy young adults, whose age range was 20 to 35 years, who were selected through the snowballing technique[13], in which the selection starts with personal contacts. It is then increased by adding the first participants' contacts.

Individuals who did not present any of the following exclusion factors were considered healthy: having a history of orthopedic trauma and/or scapular girdle surgery (shoulder, arm and any part of the cervical region); presence of pain in that region and/or musculoskeletal, degenerative and/or joint disease (fibromyalgia, arthrosis, arthritis, osteoporosis, rheumatism and tendinitis); chronic or acute skin alterations; neurological and/or psychiatric problems (such as seizures and depression); use of medications such as pain killers, muscle relaxants, antidepressants or anti-inflammatory drugs and, in the case of women, pregnancy. All individuals' height and weight measurements were taken for calculating their body mass index (BMI).

The study sample was randomly divided into three groups: G1, made up of 18 individuals, who wore the elastic therapeutic tape applied with tension; G2, made up of 17 individuals, who wore the elastic therapeutic tape applied with no tension; G3 (control group), which included 16 individuals who did not wear the elastic therapeutic tape. The individuals were randomly sorted out to determine the groups.

The tape was bilaterally applied on the descending fibers of the trapezius muscle. This muscle was chosen because of its relationship with the biomechanical alignment of the face

and neck, which contributes to the various functions of the stomatognathic system and respiration[14,15].

The tension while applying the elastic therapeutic tape is due to the spandex thread stretching, which promotes greater sensorial information in the integumentary region on which it is applied. The TherapyTex® elastic therapeutic tape (approved by the National Health Surveillance Agency under registration 8078464001) was used for this research.

Surface electromyography (sEMG) – a tool that provides muscle electrical activity data – was used to measure the intervention. Such resource is used both at the clinic and in speech language pathology research[16,17].

All the electromyographic recordings were carried out using standard surface sensors. A New Miotool® 8-channel surface electromyograph (Miotec Equipamentos Biomédicos, Brazil) was used, enabling two 16-bit resolution channels and a sampling rate of 2,000 samples per second. Following the recommendation from the SENIAM (*Surface ElectroMyoGraphy for the Non-Invasive Assessment of Muscles*)[18], circular, single type Kendall Pediatric Medi-Trace™ 100 disposable electrodes were used. These electrodes are constituted of chlorinated silver (Ag/AgCl), measure 10mm in diameter, and are associated to a conductive gel.

This EMG system has a 20 to 500 Hz wide (RMS) bandwidth filter, as well as a 60-Hz notch filter. The system uses the active electrode technology, a compact sensor assembly that includes a miniaturized instrument preamplifier. The location of the amplifier at the electrode site allows the artifacts to be canceled and the signal to be boosted before being transferred by the electrode cable (a 5 μV RMS noise level). Each EMG signal was full-wave and low-pass filtered. The computer program indicates the average, minimum, maximum, standard deviation (SD), as well as the amplitude of muscle activity during each attempt. The electromyographic muscle activity was quantified in microvolts (μV).

As additional material, a Dell® Inspiron 1440 laptop, with Windows 7 operating system, and a MIOTEC® MiotecSuite software were also used.

For sEMG collection, the individuals were invited to sit comfortably in an armless chair with a backrest. Their back should be supported, with their arms vertically alongside their body, feet resting on the floor, head positioned (Frankfurt plane, parallel to the ground), and their gaze directed straight ahead. They were asked to breathe normally and avoid talking or moving during the examination. In order to avoid interference, the individuals were positioned with their backs to the EMG equipment.

Subsequently, the individuals had their skin cleaned with gauze soaked in 70% alcohol and, when necessary, trichotomy was performed in order to decrease the impedance between the skin and the electrodes by using the Philips® NT9110/30 hair trimmer. The point for fixing the electrodes was determined following the SENIAM recommendations[18] – halfway through between the line of the seventh cervical vertebra (C7) and the acromion (Acr) –, and a reference electrode was fixed on the C7. The fixation points were marked on the individuals' skin by using a Securline® dermatograph marker.

A rigid velcro strip was devised for the research and it was fixed under the feet of the chair in which the volunteer was placed. The strip was then adjusted on each individual's Acr[19] (Figure 1). The purpose of this strip was to restrict movement during maximum voluntary contractions (MVC).

After fixing the electrodes and the rigid strip, the electrical activity of the descending fiber of the trapezius muscle was collected during the 10-second rest and in three five-second MVCs each, in which the first and last seconds were discarded by the program itself. G1 and G2 had their data collected before, immediately after the elastic therapeutic tape was placed (Figure 2) and after 24 hours. G3 had only two collections, before and after 24 hours, while the elastic therapeutic tape was not worn.

Collection during rest was done with no instructions given to the individual at the beginning of the examination in order to avoid the examiner's interference. The researcher demonstrated the requested movement to rule out doubts on how to perform the MVC during sEMG. The researcher provided the following instructions: "get ready" and then "contract". These instructions were repeated three times in a row; the individual should raise

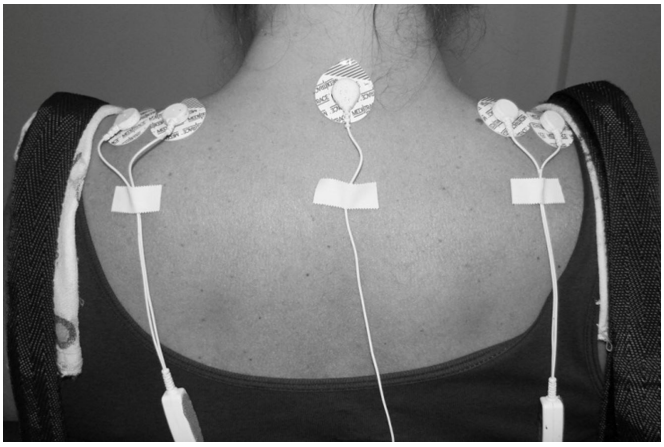

Figure 1. Image of positioning and fixing the volunteer subject's electrodes and rigid strip. Source: Authors

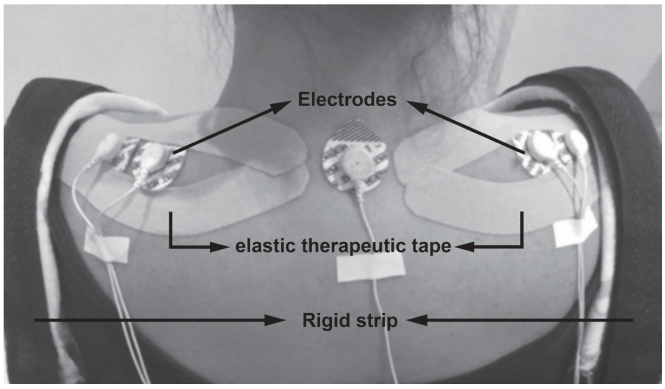

Figure 2. Image of subject with the elastic therapeutic tape, electrodes and rigid strip. Source: Authors

their shoulders as closely as they could towards their ears during the instructions. After 5 seconds, upon hearing the word "relax", they should return to the initial position. Prior to data collection, this sequence was rehearsed once to prevent the individual from doing it wrong. It is worth mentioning that the individual performed three 5-second MVCs, with a 10-second rest interval between contractions to prevent muscular fatigue.

After collecting sEMG, G3 was released and the elastic therapeutic tape was placed on G1 and G2 individuals. The Y[2] application technique (Figure 3) was used for these groups. The elastic therapeutic tape total extent was measured from C7 to Acr. Subsequently, the elastic therapeutic tape was split in half by two thirds of its total extension, those being considered as the tape applied with no tension.

Looking to determine the tension of the tape applied on G1 individuals, a quarter of the extension of each leg of the tape applied with no tension was removed. Therefore, the elastic therapeutic tape tension could be determined more precisely. There are studies[4,11] that point to a percentage of the tension, but there is no clear explanation how it was obtained.

The individuals who wore the elastic therapeutic tape were given verbal and written instructions on how to wear it. Moreover, they were instructed to keep wearing the tape until the following day, without changing their daily routine.

The EMG analysis data were obtained in RAW, a gross recording of the μV electrical signal. Frequency spectrum was verified by Fast Fourier Transform (FFT) to identify noise and the signal artifacts. After rectifying the signal, the values were obtained in root mean square (RMS)[20], by using MiotecSuite®. Values for the three MVCs in RMS were determined, in addition to the resting value, which was obtained before the contractions.

In order to compare the data before the intervention, after the intervention itself and intersubjects, the EMG data were normalized in accordance with the literature[19,21]. The normalization process is fundamental to compare EMG signals between the records of the same individual or between different individuals. In this way, interference factors related to instrumentation and individual factors, such as muscle geometry and tissue impedance[22], can be reduced.

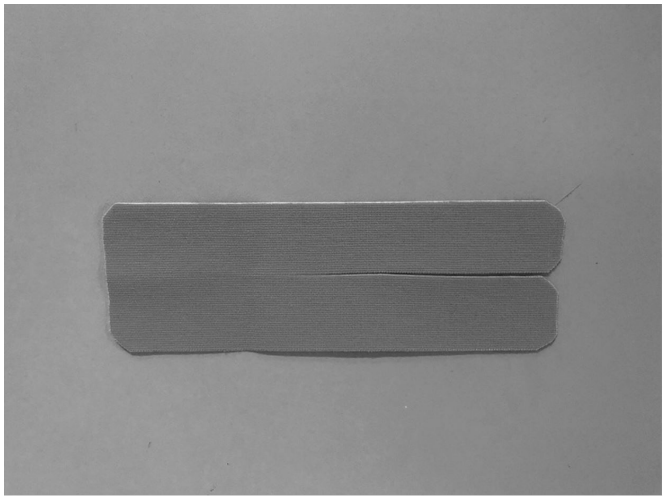

Figure 3. Model cut of tape for the Y technique. Source: Authors

Performing normalization by the EMG signal peak was chosen in this research. Therefore, the data obtained represent the conversion of the absolute values of the record (mean electrical activity) as a percentage of a reference value (electrical activity maximum peak).

Besides using sEMG, a questionnaire was developed to collect qualitative and perceptual data regarding the use of the elastic therapeutic tape. The questionnaire was composed of two parts: one part for identification, which contained information on age, sex, weight, height, manual dominance and profession; and the other one was applied after the individuals wore the tape, in order to verify the changes in their routine, their feelings while wearing it, as well as whether they felt uncomfortable while wearing the tape. This second part was only answered by G1 and G2 individuals.

The data were scanned to an Excel spreadsheet and analyzed in SPSS version 17. Statistical analysis verified the differences related to the sex, age and body mass index (BMI) among the groups investigated. In addition, the chi-square test was applied. The Anova and Kruskal-Wallis statistical test was used to compare the muscle electrical activity data between G1 and G2, both at rest and MVC moments. The same test was used to compare the EMG data at rest and MVC moments for G1, G2 and G3. A significance level (p) of 5% (0.05) was established, marked with an asterisk (*).

RESULTS

Table 1 shows the description and comparison of the data related to age, BMI and gender among the groups of individuals investigated, which demonstrates the sample homogeneity.

In order to compare the groups and rule out the influence of the initial values of the rest and MVC variables, when comparing the groups, each individual's relative difference (RD) was considered. The RD between the responses of the pre- and while moments is given by: RD = [(during-pre) / pre] x 100; and similarly, RD between pre- and post- (24h) is given by: RD = [(post-pre) / pre] x 100. Therefore, RD indicates how much the individual's response varied after the treatment, whose values are represented in Tables 2 and 3.

Table 2 shows the comparison of the EMG data during rest and VMC moments, both on the right and left sides of G1 and G2 individuals. It was noticed that there was a statistically significant difference between the groups only for the left MVC result.

The comparison of the EMG data among the three groups investigated is shown in Table 3 and no statistically significant difference of such data can be observed.

Figure 4 shows the number of positive responses in the questionnaire for G1 and G2 after individuals wore the elastic therapeutic tape. It should be emphasized that eight G1 and G2 individuals reported a greater relaxing feeling after wearing the elastic therapeutic tape, followed by itchiness (six G1 individuals and five G2 individuals) as well as improvement in sleep quality (three individuals in G1 and five in G2).

Table 1. Numeric distribution, average, standard deviation, minimum and maximum values of such variables as sex, age and BMI, according to the research study groups

	Groups		N	Average	SD	Minimum	Maximum	p-value
Sex	G1	Female	11	-	-	-	-	0.96
	G1	Male	7	-	-	-	-	
	G2	Female	10	-	-	-	-	
	G2	Male	7	-	-	-	-	
	G3	Female	9	-	-	-	-	
	G3	Male	7	-	-	-	-	
Age	G1	-	18	26.3	4.3	20	35	0.74
	G2	-	17	25.2	4.7	20	35	
	G3	-	16	25.9	4.5	20	34	
BMI	G1	-	18	24.8	4.3	18.4	35.3	0.99
	G2	-	17	24.7	3.9	19.5	33.6	
	G3	-	16	24.9	4.7	17.8	33.6	

Chi-square test for association (gender comparison); Kruskal-Wallis test (age and BMI comparison)
Caption: N = number of individuals; SD = standard deviation; G1 = group of individuals wearing elastic therapeutic tape with tension; G2 = group of individuals wearing elastic therapeutic tape without tension; G3 = control group; BMI = body mass index (weight over height squared); p-value = descriptive level

Table 2. Comparison among average, mean, standard deviation, minimum and maximum values of relative difference of the EMG data normalized according to rest and maximum voluntary contraction variables of both sides at moments pre- and immediately after applying the tape, among G1 and G2

Variables	Group	Average	Mean	SD	Minimum	Maximum	p-value
							Kruskal-Wallis
Rest (R)	G1	-8.0	-4.0	30.6	-75.8	48.8	0.906
	G2	-8.3	-4.3	19.6	-57.9	14.4	
Rest (L)	G1	5.4	-2.7	22.7	-18.2	59.1	0.344
	G2	1.3	2.1	27.5	-84.6	58.5	
MVC (R)	G1	5.8	2.2	16.1	-15.1	46.0	0.236
	G2	-1.4	-0.8	8.2	-16.7	9.7	
MVC (L)	G1	-0.4	2.0	9.7	-13.3	30.3	**0.044***
	G2	3.8	5.6	8.7	-13.3	18.9	

*significant value ≤ 0.05 Kruskal-Wallis test;
Caption: SD = standard deviation; R = right side; L = left side; MVC = maximum voluntary contraction; G1 = group of individuals wearing elastic therapeutic tape with tension; G2 = group of individuals wearing elastic therapeutic tape without tension; p-value = descriptive level

Table 3. Comparison among average, mean, standard deviation, minimum and maximum values of relative difference of the EMG data normalized according to rest and maximum voluntary contraction variables of both sides at pre- and post among G1, G2 and G3

Variables	Group	Average	Mean	SD	Minimum	Maximum	p-value
							Kruskal-Wallis
Rest (R)	G1	-4.9	-2.2	38.5	-87.3	92.3	0.537
	G2	3.3	2.8	28.1	-66.8	64.2	
	G3	7.5	1.1	46.2	-58.6	152.7	
Rest (L)	G1	2.4	0.4	20.9	-33.2	45.9	0.697
	G2	2.7	0.2	9.9	-14.2	21.4	
	G3	2.0	3.6	18.2	-15.2	49.4	
MVC (R)	G1	1.7	0.4	23.3	-61.1	54.4	0.732
	G2	-0.2	1.0	8.8	-18.9	12.7	
	G3	3.1	3.5	9.6	-13.3	23.9	
MVC (L)	G1	5.8	6.4	11.5	-11.6	31.3	0.710
	G2	2.6	0.7	10.2	-18.6	22.3	
	G3	3.4	3.2	7.0	-9.7	20.7	

Kruskal-Wallis test
Caption: SD = standard deviation; R = right side; L = left side; MVC = maximum voluntary contraction; G1 = group of individuals wearing elastic therapeutic tape with tension; G2 = group of individuals wearing elastic therapeutic tape without tension; G3 = control group; p-value = descriptive level

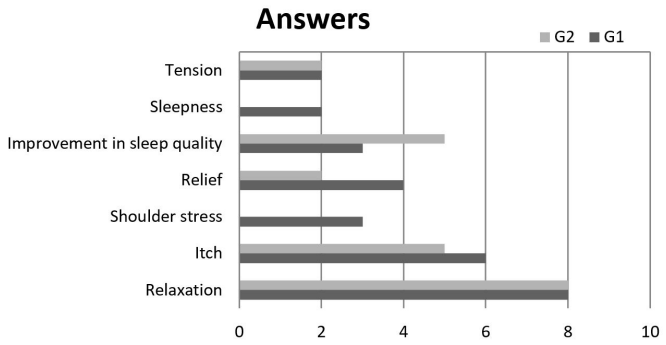

Figure 4. Comparison chart of positive answers to the questionnaire between G1 and G2 with respect to feelings related to elastic therapeutic tape application

DISCUSSION

The therapeutic resource of the elastic tape has become widely used in speech-language therapy in recent years. This resource is on the agenda of several clinical discussions, in congresses, articles and among other scientific meetings[1,9-12], although its current use is still greatly based on clinical practices[1,3].

Even though the clinic is the starting point, there is now a concern in scientific research, in which its effects can be compared and measured[10,12,23,24]. The greatest challenge of this study was how to quantify such changes in a healthy population.

In the search for the best tool to measure the effects of the elastic therapeutic tape, as pointed out above, surface electromyography was chosen to be used in this study. This tool was chosen because of its frequent application in scientific studies, which aim at verifying the change in muscle conditions in therapeutic interventions[17,19,23].

The population in this study was made up of healthy individuals. This population was chosen with the aim of focusing on the action the elastic therapeutic tape exerts on the muscle fiber in normal patterns, in a homogeneous sample.

It is worth noting that the elastic therapeutic tape is a therapeutic resource used in conjunction with other resources, techniques and exercises in speech-language therapy, in motor and/or functional treatments. In this research study, such resource had to be isolated, which characterizes a research focus on the manner it is used.

The descending fiber of the trapezius muscle was chosen because it was related to the biomechanical alignment of the face and neck and, therefore, it contributes to the various functions of the stomatognathic and respiratory systems[14,15,25].

It is observed that, in relation to the demographic characteristics such as sex, age and body mass index (BMI) of the sample individuals, there was no statistically significant difference among G1, G2 and G3. BMI was considered as a possible variable among the groups, so that there were no discrepancies with respect to the adipose tissue, which would interfere in the integumentary sensation caused by the elastic therapeutic tape application. Therefore, after analyzing the variables investigated, it is possible to notice homogeneity among the groups investigated.

When comparing the EMG data of G1 and G2 individuals, no statistically significant difference was observed, although a significant difference was observed in the maximum voluntary contraction (MVC) variable on the individuals' left side while measuring G1 relative difference when compared to G2. It is believed that this difference was observed due to an isolated fact, since the other similar variables, namely, those which are also related to the parameters to be investigated, did not obtain significant differences when compared among the groups investigated. On the authors' clinical experience, it was not possible to confirm a change in only one of the aspects studied, which makes this fact to be considered as an isolated one, with no functional repercussion.

When comparing G1, G2 and G3 at rest (before) and after using the elastic therapeutic tape, no statistical difference was observed in the EMG data. By analyzing the results, it was possible to confirm that the subjects in the group wearing the elastic therapeutic tape applied with tension (G1), the group wearing the elastic therapeutic tape applied with no tension (G2) and the control group (G3) produced widely varied responses in EMG, although they were similar when comparing the groups.

These findings are similar to those in the study[26] conducted to verify the immediate and late effects on the femoral quadriceps, on balance and lower limb function in 36 healthy women. Those women were randomly divided into three groups: control (with a 10-minute rest), one group wearing the elastic therapeutic tape applied with no tension on the quadriceps and the other group wearing the elastic therapeutic tape applied with tension on the same muscle. In order to measure the results, the isokinetic performance with dynamometer and on baropodometry platform, single jump test, static balance in one foot and five-step sEMG were evaluated before any intervention, immediately after the intervention and within a 48 and 72-hour interval, the latter being performed 24 hours after removing the elastic therapeutic tape. No change was confirmed in the issues evaluated. The authors pointed out the need for studies in the population under a rehabilitation process.

Creating a group who had the elastic therapeutic tape applied with no tension (in this case, G2) was justified by the hypothesis that only stimuli in the integumentary system would already be enough to stimulate the somatosensory receptors inserted in the skin and thus produce motor responses[2]. According to certain authors[5,26], integumentary stimulation by applying tension-free elastic therapeutic tape may be considered a kind of placebo.

It was expected in this study that individuals who had the elastic therapeutic tape applied with tension had a greater muscle relaxing response compared to those who had the elastic therapeutic tape applied with no tension. It is noteworthy that many of the healthy individuals at rest in the study already presented divergent values. The results showed that, in addition to the similarity of the EMG data between G1 and G2, the questionnaire results, after wearing the elastic therapeutic tape, were similar in most individuals when it comes to relaxation. Regarding sleep quality, the most expressive result occurred in G2, a group wearing tension-free elastic therapeutic tape. It is important to note that itchiness was an expected response, since increased blood circulation may generate such response.

The individuals in two groups (G1 and G2), on whom the elastic therapeutic tape was applied, were not informed about any possible effects of the elastic therapeutic tape. Upon applying the questionnaire, we realized that those individuals reported improvement in their sleep pattern. Such effect is expected, since the muscles relax when the tape is applied. Therefore, it can be inferred that the elastic therapeutic tape served its therapeutic purposes, even though the electromyography had not produced such data.

Nowadays, there are numerous technological resources for measuring data available, although they are not always able to capture the information subtleties at the clinic. Objectifying the subjective is the greatest challenge of the clinical researcher. In this research, there was an attempt to find a tool for measuring results quantitatively; however, it may not have been effective to show possible muscle changes due to the taping application on individuals who have no complaints, which in turn were noticed in the qualitative questionnaire.

The results obtained by subjective measurements can be found in a study conducted[27] with the aim of verifying the effect of neuromuscular electrical stimulation on the deglutition of individuals who had experienced a stroke. In this study, two groups of individuals were compared: one receiving electrical stimulation and the other receiving traditional speech- language therapy, using measurement methods such as the deglutition videofluoroscopy, the analogue scale for self-assessing complaint, nutritional assessment and oral-motor function assessment. The results showed that all patients benefited from electrostimulation, with changes in subjective assessment data, although there was no difference among the objective evaluation results.

Over the last years, Medicine and, more recently, Speech Language Pathology, have begun to seek evidence-based practices in their scientific research. As in other areas, this path is intended to promote scientificity in clinical practice. Isolating a therapeutic resource, as was done to the elastic therapeutic tape in this study, does not reflect a truly clinical practice, since it has wide, complex and individual approaches in the rehabilitation process.

In a separate study, the authors[28] investigated the effect of the elastic therapeutic tape on 21 individuals suspected of having shoulder impingement syndrome. They verified the reduction of electrical activity using electromyography while those individuals tried to reach out for a shelf. The parameters were increased at the moment prior to using the elastic therapeutic tape, due to the dysfunction presented. The authors pointed out that functional modifications occurred because the elastic therapeutic tape was applied on the trapezius muscle. The study mentioned above shows that measuring electrical activity while performing a task is, in fact, different from the isolated movement. From this perspective, one can think how much such issue influenced this research.

When reflecting on the results found in this research study and the findings in the literature, certain issues have arisen. The first point is whether electromyography is truly an adequate tool to measure muscle relaxation, since there is no parameter of normality values for muscles considered normal. Consequently, electromyography, especially in the normal population, might not have been the most appropriate tool to measure the possible relaxation caused by wearing the tape. Another point was how to measure and compare the proprioception in each healthy individual, since the perception of the body is absolutely subjective and dependent on each individual's life history.

The elastic therapeutic tape is a resource that is a piece of a whole within a therapeutic planning. It is not a resource that replaces the therapist's clinical expertise and knowledge about treatment procedures, but rather complements the rehabilitation process. The results of this study suggest that using the elastic therapeutic tape provided positive qualitative results in healthy individuals. Further studies may investigate the application of this therapeutic resource to different populations with orofacial and speech motility disorders, whether or not they are associated with other diseases.

One of the limitations of this study was that, despite being randomized, the examiner who collected the data was not blind towards the groups. Nonetheless, both the collection and the procedures carried out followed the SENIAM and ISEK standards and recommendations. It is believed that future studies on this topic should include a double-blind study.

CONCLUSION

In the investigated group of healthy individuals, the elastic therapeutic tape applied on the trapezius muscle had no effect on the muscle electrical activity measured by sEMG. However, qualitative gain was observed in relation to muscle relaxation and sleep quality according to the self-reported questionnaire applied.

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APS, the main author of this article, developed and carried the research, besides writing the article; ARRC and FCS helped with suggestions to change and correct the article; MAAS helped with preparing the research, development and correction of the article.