



The Effectiveness of Facial Exercises for Facial Rejuvenation: A Systematic Review

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Abstract

Background: Although aesthetic correction of facial aging had long been the exclusive domain of plastic surgeons and dermatologists, alternative nonmedical approaches to facial rejuvenation are becoming more popular, such as facial acupuncture, facial acupressure, and facial exercises. However, the effectiveness of these alternative approaches is still a topic of debate.

Objectives: The authors review the evidence of the effectiveness of facial exercises for facial rejuvenation.

Methods: A literature search was performed in Medline, Web of Science, Science Direct, SciELO, and LILACS databases for the terms *facial rejuvenation*, *facial exercises*, *facial massage*, *face building*, *face yoga*, *(oro)facial (a)esthetics*, *(a)esthetic logopedics*, and *(a)esthetic speech therapy*. Nine reports were identified from the search and were subject to further assessment.

Results: Although positive outcomes were achieved in all 9 studies, none of the studies used a control group and randomization process. They were single case reports, small case series, or studies with a single-group pretest-posttest design. Moreover, the effectiveness assessments in most of the studies were purely subjective, carried out by the authors and/or the patients themselves, without blinding.

Conclusions: The evidence to date is insufficient to determine whether facial exercises are effective for facial rejuvenation. Evidence from large randomized controlled trials will be needed before conclusions can be drawn.

Keywords

facial rejuvenation, facial exercises, esthetic logopedics, facial aging

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Aesthetic correction of facial aging had long been the exclusive domain of plastic surgeons and dermatologists, who perform procedures such as chemical peels, injection of botulinum toxin and dermal fillers, laser treatment, facelifts, browlifts, and eyelid surgery. However, alternative approaches to facial rejuvenation are becoming more popular, such as facial acupuncture, facial acupressure, and facial exercises. These alternative techniques, which are less invasive and often less expensive than traditional medical procedures, usually are performed by nonmedical professionals. In at least 1 country (Brazil), the use of orofacial exercises for aesthetic reasons is even recognized officially as a subspecialty of speech-language pathology.¹ However, the effectiveness of alternative nonmedical approaches to facial rejuvenation remains a topic of debate. In fact, the overuse of facial muscles is often the cause of wrinkles; hence, such exercises may have the opposite effect from what is intended.²

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The goal of the present study was to review evidence of the effectiveness of facial exercises for facial rejuvenation. To our knowledge, no systematic review has been performed previously.

METHODS

For the purpose of this review, *facial exercises* were defined as exercises implying strength, movement, or manipulation of facial muscles. Excluded from the review were medical approaches such as chemical peels, injection of botulinum toxin and dermal fillers, laser treatment, facelifts, browlifts, and eyelid surgery. Also excluded were reports of acupuncture and acupressure techniques that focus on so-called acupressure points rather than on specific muscles. Studies of combined approaches were not permitted (eg, facial exercises in conjunction with a medical procedure or with the use of creams or face masks), nor were studies on the use of appliances for facial muscle training. The review was further restricted to facial exercises solely for the purpose of facial rejuvenation. (Studies of facial exercises after head trauma, as part of treatment for facial nerve paralysis, or for any other pathologic condition were not considered.)

It is not uncommon in systematic reviews of treatment effectiveness to include only double-blind randomized control trials, which generally are recognized as the gold standard. However, since our topic is relatively novel, we elected to accept all types of group designs as well as single-subject designs and case studies. We limited our search to original research reports in peer-reviewed journals but did not impose restrictions on language or date of publication.

The databases searched initially were Medline, Web of Science, and Science Direct. The search terms were *facial rejuvenation*, *facial exercises*, *facial massage*, *face building*, *face yoga*, *(oro)facial (a)esthetics*, *(a)esthetic logopedics*, and *(a)esthetic speech therapy*. The search was conducted by 2 of the authors (JVB and M-CDV), and any decision pertaining to including or excluding a given study was made by consensus.

RESULTS

Although the initial search generated many studies potentially of interest (Medline: 1089; Web of Science: 278; Science Direct: 408), after analysis of the titles and abstracts, none of them met the inclusion criteria. Therefore, we decided to expand the search to include 2 major South American databases: SciELO and LILACS. This decision was based on the knowledge that in at least 1 South American country (Brazil), “aesthetic logopedics” is a recognized subspecialty of speech-language pathology, and on awareness of publications in national Brazilian journals. The criteria and procedures used for the initial search were applied to the subsequent search, which identified another 92 (SciELO) and 148 (LILACS) potentially relevant studies. After analysis

of titles and abstracts and removal of duplicates, 4 studies were deemed eligible for further assessment. The full text of these studies was retrieved, and their reference sections were examined in the effort to uncover additional relevant studies that had not appeared via the electronic searches. Five additional studies were discovered from this process, bringing the total number to 9. All 9 studies were then subjected to a descriptive analysis that served as the basis for quality appraisal. The descriptive analysis examined the study design, number of patients, age and sex of patients, characteristics of the training program, procedures for outcome assessment, and results. The quality appraisal was inspired by Jadad et al.³

Descriptive Analysis

As shown in Table 1, the 9 relevant studies comprised a total of 43 patients, ranging in age from 31 to 87 years. Most of the patients were women. Only 2 studies included men. Takacs et al⁴ studied 6 women and 2 men, and Paes et al⁵ studied men and women but did not specify the number of each sex.

Most of the studies were individual case reports or small case series.⁶⁻¹¹ Exceptions were the studies by Takacs et al,⁴ Paes et al,⁵ and Arizola et al,¹² which included 8, 10, and 11 patients, respectively. All case reports and case series used an individualized treatment program.⁶⁻¹¹ In the larger studies,^{4,5,12} all patients received the same treatment regimen. The patients studied by Paes et al⁵ received group therapy as well as individualized therapy.

The studies provided varying degrees of detail about the exercises used, and the components of the treatment programs differed from study to study. Apart from the study by Takacs et al,⁴ more than 1 type of exercise was used by each patient. Takacs et al⁴ used only isometric exercises (ie, strength training in which the length of the targeted muscle does not change). Their study targeted various muscles of expression in the upper, middle, and lower face, by means of 6 exercises: (1) lifting the eyebrows and frowning the forehead, (2) approximating the eyebrows, (3) closing the eyes with strength, (4) protruding the lips, (5) spreading the lips, and (6) contracting the right and left cheek against resistance. Each exercise was done once a day, and each position was held for 7 seconds.

Isometric exercises appeared to be the most common type of treatment, together with isotonic exercises in some patients (ie, strength training in which the tension of the muscle does not change). For instance, an isotonic exercise used by Arizola et al¹² to reduce forehead wrinkles consisted of lifting the eyebrows as much as possible for a few seconds, then slowly releasing them. The exercise was repeated several times.

Other exercises included in some studies were massage^{5-7,9,10} and stretching.^{6-8,10-12} In several studies, patients also received general advice and guidelines on facial care (eg, use of sun protection and sunglasses), the importance of hydration, and the adverse effects of smoking.^{5-7,11}

Table 1. Summary of Studies Included in the Systematic Review

Study	Design and Patients	Training Program	Outcome Assessment	Results
Takacs et al ⁴ (2002)	One-group pretest-posttest design N = 8 (6 women, 2 men) Age range: 31-66 y	Similar 12-wk program for all patients, which they executed at home: daily workout consisting of 6 isometric exercises targeting various muscles of expression of the upper, middle, and lower face	1. Patients completed a questionnaire 2. Eleven individuals blinded to the purpose of the study received pre- and posttherapy clinical photographs of each patient and were asked to specify the photograph in which the patient looked youngest and oldest	1. Four of the 8 patients reportedly observed improvement: Reduction of wrinkles (n = 1) Improved facial expression (n = 2) Reduction of facial sagging (n = 1) 7 patients reported that others had noticed improvement 2. The percentage of correct identification of the images by the blinded individuals varied by patient and ranged from 45.4% to 100%
Paes et al ⁵ (2007)	One-group pretest-posttest design N = 10 (women and men) ^a Age range: 33-63 y	Daily workout and weekly therapy session for 8 wk Group therapy: 1. Guidelines on facial care 2. Isotonic exercises 3. Isometric exercises 4. Isokinetic exercises 5. Facial manipulation 6. Massage 7. Search for balance in the stomatognathic system Individual therapy: 1. Intraoral manipulation 2. Individualized comments and exercises	1. Patients completed a questionnaire 2. Measurement of the distance between the nasolabial sulcus and the tragus (before and after treatment)	1. All patients reportedly observed changes in their face after treatment; 7 patients reported that others had noticed a change 2. Treatment resulted in significant reduction of the distance between the nasolabial sulcus and the tragus from a mean of 92.2 mm to a mean of 88.3 mm on the right and from a mean of 94.1 mm to a mean of 88.5 mm on the left (paired <i>t</i> -test, <i>P</i> = .023 and <i>P</i> = .001, respectively).
Franco and Scattone ⁶ (2002)	Case report N = 1 woman Age: 35 y	Individualized 5-wk training program consisting of daily workout and weekly therapy session: 1. Information on the oral structures and functions (chewing, swallowing, and speech) and facial care 2. Massage 3. Stretching 4. Specific exercises 5. Learning proper execution of the stomatognathic functions	Observation of the authors (a speech pathologist and a dermatologist) and the patient	Relieved and relaxed feeling Relaxation of facial muscles Reduction of furrows
Mattia et al ⁷ (2008)	Case report N = 1 woman Age: 56 y	Individualized treatment consisting of 10 therapy sessions, ^b each including: 1. Changing posture 2. Lengthening muscles and reducing tension 3. Cervical stretching 4. Relaxation of the muscles 5. Facial stretching 6. Heating 7. Manipulation maneuvers (~20 min) 8. Facial exercises (~20 min) 9. General tips (relating to bilateral chewing, hydration, etc)	Visual observation aided by clinical photographs (pre- and posttherapy) and anthropometry	Reduction of wrinkles, furrows, and sagging of facial skin Increase of blood circulation in the face Improved facial symmetry
Santos and Ferraz ⁸ (2011)	Case report N = 1 woman Age: 47 y	Weekly individualized treatment for 8 wk: 1. Stretching masseters 2. Manipulation of the facial muscles 3. Isometric exercises	Visual observations and evaluation by the patient and the authors, aided by clinical photographs	Patient: Improved feeling of well-being Reduction of wrinkles and expression marks Authors: Improvement in facial symmetry and functions related to mandibular biomechanics

(continued)

Table 1. (continued)

Study	Design and Patients	Training Program	Outcome Assessment	Results
Lana e Silva et al ⁹ (2010)	Case series N = 4 women Age range: 40-51 y	Daily (30-min) individualized treatment sessions for 20 days: myofunctional exercises in the left hemiface and massage in the right hemiface, targeting expression wrinkles of the orbicularis oculi muscle	1. Patients were asked if they perceived any difference after treatment 2. Clinical evaluation by 1 dermatologist and 1 plastic surgeon, plus photographic evaluation by 10 speech-language pathologists	1. Differences observed by all 4 patients 2. All patients experienced improvement. There were no differences between the 2 evaluation techniques
Frazão and Manzi ¹⁰ (2012)	Case series N = 3 women Age range: 41-49 y	Individualized treatment consisting of daily exercises (at home) and weekly 50-min sessions for 12 wk: isometric and isotonic exercises, stretching, and facial massage	1. Patients were asked about their satisfaction with the treatment 2. Evaluation by the authors (pre- and posttherapy) consisting of visual observation aided by clinical photographs and videos	1. All 3 patients reportedly were satisfied with the treatment 2. Signs of aging diminished in all 3 patients
Matos et al ¹¹ (2010)	Case series N = 4 women Age range: 55-87 y	Individualized treatment consisting of daily exercises (at home) and weekly 1-h sessions for 10 wk: isotonic and isometric exercises, stretching, facial and cervical manipulation, and information on facial care	1. Patients completed a questionnaire 2. Evaluation by the authors (pre- and posttherapy) consisting of visual observation aided by clinical photographs, videos, and anthropometry	1. All 4 patients perceived changes, 3 of whom also reported that changes had been observed by others 2. Reduction of wrinkles and sagging; improvement of facial symmetry and movements during chewing, swallowing, and speaking; improvement in anthropometric parameters
Arizola et al ¹² (2012)	One-group pretest-posttest design N = 11 women Age range: 40-50 y	Similar program for all patients, consisting of 2 sessions per week for 5 wk: isotonic and isometric exercises targeting the forehead, jaw, eyes, cheeks, and lips; softening and stretching of facial muscles	1. Patients completed a questionnaire regarding perceived changes and scored satisfaction with their facial appearance before and after treatment on a visual analog scale 2. Three speech-language pathologists specializing in oral motricity evaluated before- and after clinical photographs and indicated the presence or absence of changes	1. All 11 patients perceived changes, 5 of whom also reported that changes had been observed by others; satisfaction with facial appearance increased significantly (Wilcoxon, $P = .05$) 2. Agreement among the specialists was lacking (kappa, $P > .05$). For a number of aspects, some changes were perceived

^aSex breakdown not provided.

^bOverall treatment period not provided.

The frequency and duration of training varied. In most instances, a daily workout at home was required of the patient, sometimes supplemented by weekly sessions with a therapist.^{5,6,10,11} In other studies, the intervention was limited to 1 or 2 weekly sessions,^{8,12} which always involved the therapist. The overall duration of therapy ranged from 20 days⁹ to 12 weeks.^{4,10}

All 9 studies included an evaluation of the results, and different procedures were used for this purpose. In all but 1 study,⁷ the patients themselves were involved in the evaluation. Some patients completed a questionnaire on perceived changes^{4,5,11,12} and/or scored satisfaction on a visual analogue scale.¹² In other studies, the evaluation was less formal: patients were simply asked if they perceived any difference after treatment^{6,9} or if they were satisfied with the

treatment.¹⁰ In 6 of the 9 studies, the authors performed evaluations based on visual perception, which either were purely clinical^{6,9} or aided by photographs and/or videos obtained before and after therapy.^{7,8,10,11}

Several studies used more objective methods of evaluation. Takacs et al⁴ enlisted 11 independent "judges," blinded to the study details, and asked them to place pre- and posttherapy photographs of the patients in the correct order (ie, identifying the image in which the patient looked youngest and the image in which the patient looked oldest). Lana e Silva et al⁹ asked 10 speech-language pathologists specializing in orofacial motricity to judge whether the patients improved, became worse, or had no change, based on examination of pre- and posttherapy photographs. Similarly, Arizola et al¹² asked 3

speech-language pathologists specializing in orofacial motricity to score the degree of change (large, moderate, small, minimal, none) from comparing pre- and posttherapy photographs. Paes et al,⁵ Mattia et al,⁷ and Matos et al¹¹ used anthropometry to verify possible changes after therapy but did not specify how the reliability of the measurements was confirmed.

The authors of all 9 studies reported positive outcomes and concluded that their patient(s) had improved. However, most of the outcomes were reported using verbal descriptions or descriptive statistics. Only Paes et al⁵ and Arizola et al¹² applied a statistical test to compare their patients' appearance before and after therapy.

Quality Appraisal

Although all 9 studies had positive outcomes, none of them had a control group and none were randomized. They were single case reports, small case series, or studies that used a single-group, pretest-posttest design. Moreover, nearly every study included more than 1 type of exercise; this was true even in larger studies that potentially would have allowed for a more in-depth analysis. The inclusion of more than 1 type of exercise complicated assessment of the possible effectiveness of any particular exercise. Thus, it remains unclear if perhaps a certain type of exercise is more often associated with a positive outcome. In addition, most studies used a subjective assessment of effectiveness by the authors and/or the patients themselves, which usually was limited to descriptive factors. Of the studies that included assessors who were unrelated to the investigation for the purpose of assessing outcomes, only Takacs et al⁴ used blinding. For each of their 8 patients, 11 judges were presented with 2 clinical photographs (1 pretherapy, 1 posttherapy) from which they selected the image in which the patient looked youngest in their opinion. For each patient, the number of judges who believed that the patient looked younger on the posttherapy image ranged from 5 (45%) to 11 (100%), which suggests that the treatment was effective. The latter study also was alone in evaluating a single type of exercise (ie, isometric). Three studies also used anthropometry to verify possible changes after therapy, but none of them included an assessment of the reliability of the measurements.

DISCUSSION

In recent years, facial exercises have been promoted as an alternative to traditional medical approaches to facial rejuvenation. There are numerous books, DVDs, and websites on facial exercises. However, skepticism also exists, and it has been claimed that presently there is no substantial evidence that facial exercises are effective for eliminating or reducing wrinkles.² As far as we could ascertain, neither claims in favor nor warnings against the use of facial

exercises, thus far, have been based on a review of the available evidence. Therefore, it seemed timely to systematically review the evidence of the effectiveness of facial exercises for facial rejuvenation. To our knowledge, the present study is the first such systematic review and thus may serve as a starting point for further research on this topic.

From our search of major scientific databases (Medline, Web of Science, Science Direct, SciELO, and LILACS), we identified 9 studies that met eligibility criteria. All were from South America. Although our extensive search did not reveal published studies from any other regions of the world, this does not mean that the use of orofacial exercises for aesthetic purposes is nonexistent elsewhere. (In fact, numerous websites are dedicated to facial exercises for rejuvenation.) Rather, the lack of published studies probably reflects the absence of incorporation by a profession with scientific tradition, such as speech-language pathology, which has occurred in Brazil.

Our review shows that the existing evidence is insufficient to conclude whether facial exercises are effective for reducing signs of aging. Additional studies, with superior designs and larger patient populations, are needed—especially control group studies with random patient assignment and evaluations of the possible effects of carefully selected exercises, preferably of a single type, by judges blinded to the details of the study. For evaluations based on pre- and posttherapy photographs, random presentation of the images for both groups is essential. When objective measurements are used, reliability of the measurements should be checked and controlled for. In addition, comparisons of results between control and experimental groups should include some form of statistical analysis.

Furthermore, we need studies that not only assess but also compare the effectiveness of the different approaches and types of exercises that are currently being used. From the present study, it is unclear, for instance, whether the degree of effectiveness differs between isometric exercises and actual-movement exercises (eg, isotonic, isokinetic). In addition, the role of intensity and duration of treatment, as well as the impact of patient-specific variables such as age and signs of aging at onset, should be taken into consideration in future research. It may also be helpful to examine the possible contribution of facial exercises following facial rejuvenation surgery.

CONCLUSIONS

Although facial exercises have been promoted as an alternative to traditional medical procedures for facial rejuvenation, the paucity and quality of available evidence are insufficient for determining whether the exercises are effective for this purpose. Extensive evidence from large randomized controlled studies will be needed before conclusions can be drawn about the usefulness of facial exercises for facial rejuvenation.

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