DOI: 10.37990/medr.1258455 Med Records 2023;5(2):415-22

MEDICAL RECORDS-International Medical Journal

Research Article

Awareness of Facial Exercises/Facial Yoga for Facial Rejuvenation: A Survey Study

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Abstract

Aim: There is evidence that exercises that work the facial and neck muscles that create facial expressions and facilitate lymph circulation with their movements are effective in facial rejuvenation and keeping facial youthfulness. This study aims to determine the awareness of facial aging and the methods affecting this process, especially facial exercises/facial yoga.

Material and Methods: A 15-question survey was created to question awareness and preferences for facial aging, protecting facial youth and facial rejuvenation methods. The survey was shared online on social media apps. Statistical analyzes were performed.

Results: The majority of volunteers were female (85.1%), between 25-34 years of age (32%), university graduates (44%), with income equal to expenditure (77%), and healthcare workers (26%). Individuals were most disturbed by the changes around the eyes (34%). Most of the participants had heard of facial rejuvenation (82%) and facial exercises (86%) before, but very few (23%) had applied them.

Conclusion: It was determined that individuals were aware that facial exercises were effective in facial rejuvenation, but they did not apply them. Making a habit of facial exercises at a young age and adding them to other non-invasive methods can delay the aging of the face and the transition to some costly invasive procedure.

Keywords: Face aging, facial rejuvenation, face yoga, facial exercise

INTRODUCTION

Socio-economic developments, education, technology and biomedical developments have enabled humanity to successfully adapt to life. As a result, the fact that the population is aging has emerged. Aging is the life stage that follows the maturity period, in which organ changes occur with a decrease in body functions and results in death. The aging of people is a process that differs according to chronological, biological, social and psychological areas (1).

The region that includes the face and neck is a part of the body that determines a person's identity and is used to distinguish one person from others. Structural changes occur in the face with chronological and biological (physiological, photo) aging. Genetic factors, hormones, lifestyle, habits and environmental factors accelerate or decelerate the aging process. Volumetric changes in facial structures, redistribution of subcutaneous adipose tissue, progressive bone resorption and decrease in tissue elasticity cause facial aging. Each face ages differently and gradually according to the duration and amount of these changes (2-5). Through impaired morphological and pathophysiological mechanisms, an increase in age-related fine lines, wrinkles and skin laxity is observed in addition to pigmentary and textural changes. With aging,

CITATION
Uysal II, Yagmurkaya U, Daye M, Taspinar C. Awareness of Facial Exercises/Facial Yoga for Facial Rejuvenation: A Survey Study. Med Records. 2023;5(2):415-22. DOI:1037990/medr.1258455

Received: 02.03.2023 **Accepted:** 13.04.2023 **Published:** 02.05.2023
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the performance of the mimetic muscles, mainly in the midline of the face, decreases. Recurrent contractions and tone changes of facial muscles can make aging more pronounced. Although chronological aging cannot be prevented, the biological aging process can be delayed with a healthy diet, regular sleep, avoidance of harmful habits, and appropriate physical activities (2, 3, 5, 6).

The desire to preserve beauty and youth which is one of the oldest concepts in human history has emerged facial rejuvenation practices to address the signs of aging on the face (7). Procedures such as moisturizing, chemical peeling, abobotulinumtoxinA [BTX], injected fillers, thread facelift, and eyelid lifting are applied to eliminate the signs of photo and chronological aging on the face. Today, applications to protect youth such as facial acupuncture, facial acupressure, and facial exercises are also becoming popular (6, 7-11).

This survey study was performed to investigate the awareness of facial exercise/facial yoga by determining the methods that individuals apply both in delaying facial aging and in facial rejuvenation.

MATERIAL AND METHOD

Procedures

This study was approved by the non-interventional clinical research ethics committee (approval number 3359/2021). An electronic questionnaire was created about the demographic information of individuals, the awareness and preference of facial youth protection and rejuvenation methods. The questionnaire was first applied to a limited number of participants, and after this application, existing questions were edited and new questions were added. The new questionnaire was shared online through various applications of social media from July 2021 to August 2021.

The first part of the questionnaire was aimed at determining the socio-demographic characteristics of the participants (gender, age, education level, income level, occupation). Age was defined in six groups (15-24, 25-34, 35-44, 45-54, 55-64, 65 and over). Education levels were evaluated in four groups (primary education, high school, university and graduate graduation). Income was questioned at three levels: low (income less than expense), middle (income equal to expense) and high (income higher than expense). Five options (student, housewife, retired, health, education, other) were presented to determine the occupation.

The second part of the questionnaire consisted of 15 questions to determine the awareness of the participants about the age-related changes in the face and neck region and the applications to protect or rejuvenate them.

Statistical Analysis

Number, percentage, mean and standard deviations were used in the evaluation of descriptive statistics. The conformity of the data to the normal distribution was checked with the Shapiro–Wilk and Kolmogorov–Smirnov tests. Categorical data were analyzed with the Chi-Square test. Quantitative data were analyzed using an independent t-test for paired groups, and one-way ANOVA (post-hoc Tukey test), Mann-Whitney U and Kruskal-Wallis for three or more groups.

RESULTS

571 (15% male, 85% female) people who viewed the questionnaire electronically answered the questions. The sociodemographic characteristics of the participants are shown in Table 1. The majority of the participants are 25-34 years old (32%), university graduates (44%), income equal to the expense (77%) and health workers (26%).

Table 1. Socio-demographical characteristics of the participants

	n	%
Age		
15-24	120	21
25-34	184	32
35-44	128	22
45-54	107	19
55-64	29	5
65 age and over	3	1
Education level		
Elementary school	34	6
High school	46	13
University	249	44
Postgraduate	212	37
Income level		
Lower	58	10
Middle	438	77
Upper	73	13
Occupation		
Student	115	20
Housewife	73	13
Educator	99	17
Health worker	151	26
Other	107	19
Retired	26	5

Participants (n: 568) gave themselves an average score of 6.04 ± 2.06 out of 10 when they looked at the face and neck region in a photograph taken without a filter. They were dissatisfied with the appearance of the eye area (34%), cheek area (27%), nose area (20%), neck (17%), forehead (17%) and lip area (16%). The participants listed the causes of wrinkles and sagging on the face and neck as decreased or loss of skin elasticity (63%), weakening or tension of the muscles (56%), and excessive contraction of the muscles (20%). The rate of those who are aware of facial rejuvenation was 82%. The rate of those who stated

that they would allocate a budget from their income to feel better and have healthy skin when they looked in the mirror was 77% (n:438). The number of women (n:385, 88%) who stated that they would allocate a budget was statistically significantly higher than men (n:53, 12%) (p<0.001). While the preference for "budgeting" did not differ statistically according to income (p=0.169), statistically significant differences were found according to education and occupation (p<0.001) (Figure 1).

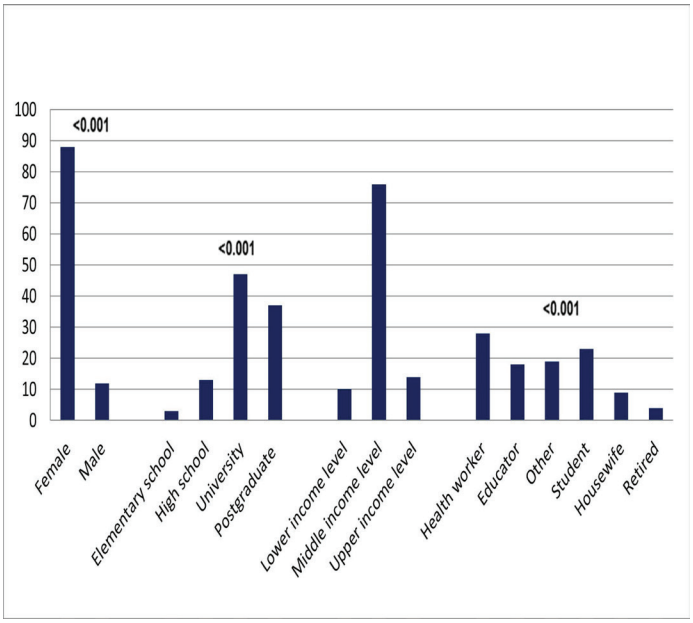

Figure 1. "When you look in the mirror, do you budget your income to feel better and have healthy skin?" Sociodemographic characteristics of the participants who answered "yes" to the question

It was questioned to keep the youth of the face and neck which methods (regular sun protection, balanced diet, daily water consumption of two liters or more, regular sleep, medical and/or cosmetic applications, and exercises) the participants used. The most effective socio-demographic factor in the preference of the applied methods is occupation (p<0.001, p<0.05) (Table 2). The application of all these methods is 18-32% in the 15-54 age group, and 5-7% in the 55 and over age group. Employees and students used these methods 24-70%, and housewives and retirees 18-58%.

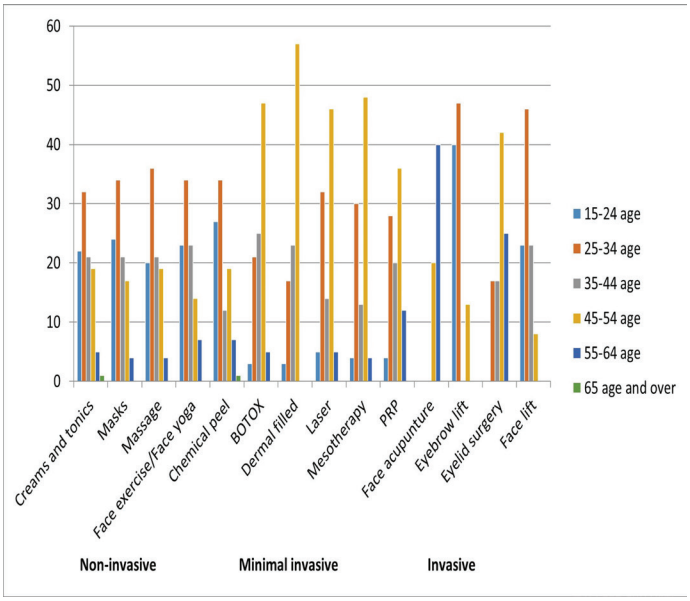

Figure 2. Preference rates of methods by age group

Table 2. The effect of socio-demographic characteristics on the selection of face and neck youth protection method

	Sex x^2	Age x^2	Education x^2	Income x^2	Occupation x^2
Regular sun protection	12.407‡	7.034	4.607	7.532†	20.010†
Balanced diet	1.963	18.510†	19.642‡	2.449	43.830‡
Daily water consumption	3.418	9.394	15.165†	1.188	15.827†
Regular sleep	3.790	8.949	8.737	5.081	22.251†
Medical /Cosmetic applications	31.691‡	5.648	18.123‡	3.289	21.950‡
Exercises	0.538	6.088	1.996	0.964	12.132†

x^2, Chi-Square test; †, p<0.05; ‡, p<0.001

All of the participants (n: 571) answered the question about the procedures to eliminate or reduce wrinkles, loss of tension and sagging on the face and neck. The awareness rates of the listed methods were 69-81% for the cream-tonic, mask, facelift, facial exercises/facial yoga, 59-64% for dermal fillers, massage, BTX, brow lift, eyelid surgery, and 37-50% for chemical peels, facial acupuncture, laser therapy, mesotherapy, PRP. The ratio of answers given to the question of which structures (skin and/or muscle) the mentioned methods affect is shown in Table 3. Most of the participants (79%) commented on the structures affected by facial exercises/facial yoga. 67% of these individuals stated that the skin and muscles were affected together (Table 3).

The distribution of method preferences according to the socio-demographic characteristics of the participants is shown in graphics (Figure 3-5). The comparison of the preference rates of the listed methods according to the socio-demographic characteristics is presented in Table 4. It was observed that all socio-demographic characteristics affected the preference of BTX, and the preference of dermal filler and mesotherapy was statistically affected by factors other than gender (p<0.05, p<0.001). Gender is the most potent factor in the preference for non-invasive methods, income and occupation in the preference for minimally invasive procedures, and age in the preference for invasive methods (p<0.05, p<0.001)(Table 4).

Table 3. Distribution of participant responses regarding which tissues are affected in face and neck rejuvenation methods

Applications	Skin %	Muscle %	Skin and Muscle %
Creams and tonics	92	1	9
Masks	96	1	4
Chemical peel	82	3	16
BTX	12	41	51
Dermal filled	36	18	50
Face acupunture	19	28	58
Face lift	43	15	46
Eyebrow lift	42	17	46
Face exercise/ Face yoga	12	30	67
Eyelid surgery	47	14	45
Laser	61	9	34
Mesotherapy	51	12	41
PRP	41	16	49
Massage	22	27	63

Table 4. The effect of socio-demographic characteristics on the selection of face and neck rejuvenation methods

		Sex x^2	Age x^2	Education x^2	Income x^2	Job x^2
Non-invasive	Creams and tonics	54.93‡	6.02	17.55‡	1.54	23.92‡
	Masks	16.93‡	22.08†	3.94	0.70	12.83†
	Massage	0.67	2.65	2.74	5.87	7.45
	Face exercise/Face yoga	8.42†	4.67	5.37	5.25	14.43
Minimal invasive	Chemical peel	2.13	8.66	2.28	0.83	5.39
	BOTOX	10.61†	55.95‡	36.81‡	13.56†	52.65‡
	Dermal filled	3.34	36.36‡	21.53‡	18.020‡	25.64‡
	Laser	1.93	12.60	7.39	16.27‡	11.44†
	Mesotherapy	2.10	19.20†	11.77†	16.17‡	20.21†
	PRP	2.45	10.59	9.54	7.44	18.31†
	Face acupunture	0.10	16.05	11.14	10.15†	3.89
Invasive	Eyebrow lift	0.32	11.55	2.51	2.20	2.40
	Eyelid surgery	0.42	16.75†	4.11	1.78	3.95
	Face lift	2.65	8.13	6.464	0.14	7.51

x^2, Chi-Square test; †, p<0.05; ‡, p<0.001

Most of the participants (86%) were aware of facial exercises/facial yoga for facial rejuvenation. Facial exercises/facial yoga were frequently heard on social media (71%), followed by television shows (31%), friends (25%), educational processes (8%), dermatologists (7%), and family physicians (1%). "Are there any other uses of facial exercises/facial yoga other than facial rejuvenation?" to the question, these participants answered "yes" (33%), "no" (2%), and "don't know" (75%).

When asked directly "Do you do facial exercises/facial yoga?", 35% of the participants stated that they applied it. The rate was 32% when questioned within the scope of protection practices, and 23% when questioned about the processes for the elimination of changes. While gender was effective (p, 0.004) in the preference for facial exercises/face yoga practices, age, education, income and occupation were not effective (p>0.05). Only 8% of individuals were doing these exercises regularly every day, and 63% did it whenever they thought of it, 19% when they felt bad, 10% when they felt good. The effect of facial exercises/face yoga on facial rejuvenation was scored as 7±2.06 out of 10 for all participants. The views of those who did and did not do facial exercise/face yoga on the effect of these practices on facial rejuvenation were close to each other (7.11±1.74, 6.23±2.14, respectively).

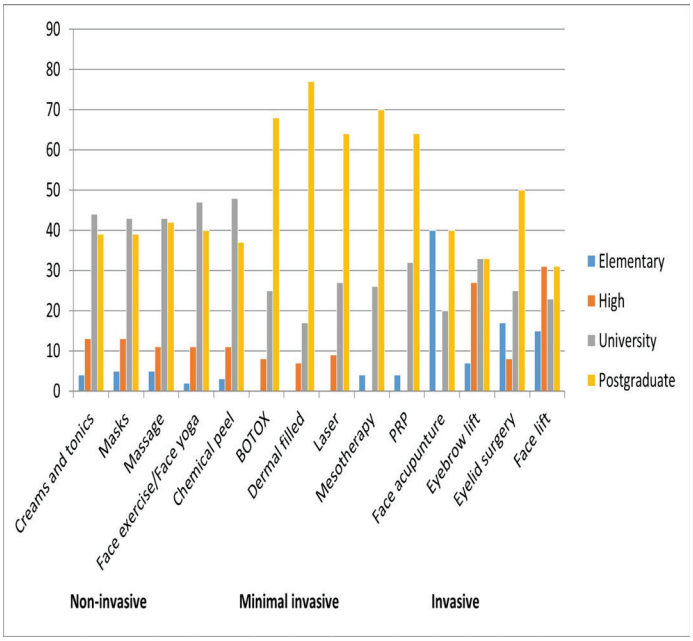

Figure 3. Preference rates of methods by education level

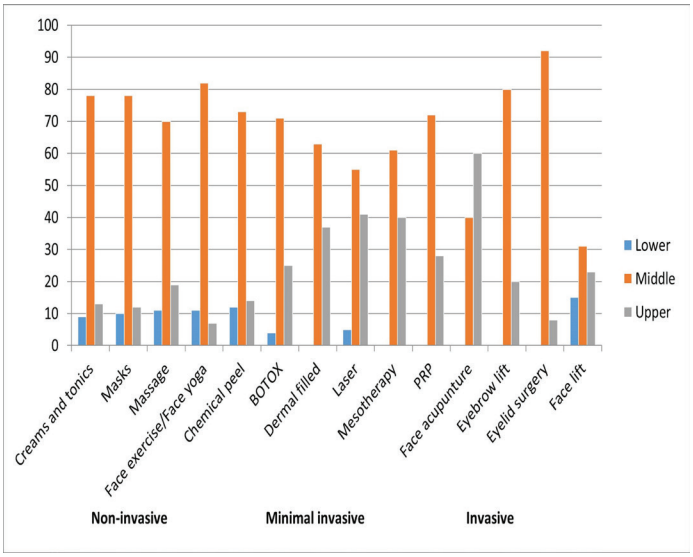

Figure 4. Preference rates of methods by income

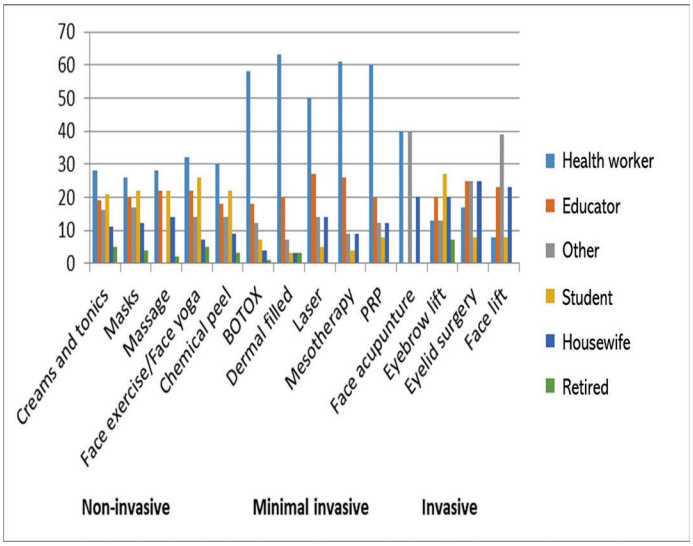

Figure 5. Preference rates of methods by occupation

DISCUSSION

The World Health Organization classifies adults as "non-elderly" (under 65 years old) and "elderly" (over 65 years old) (12). According to this classification, only 3 of the 571 people who agreed to participate in our study are elderly. The electronic questionnaire is a factor that negatively affects the participation of individuals over the age of 65. In addition to the difficulty of using technology in this population, age-related hearing, vision and movement losses and dependency on care are also in question.

The change in appearance that occurs with age on the human face is usually consistent and reveals the age of the person. Gradual changes reflecting the natural aging processes in the skin appear from about the third decade of life and become very evident over the age of 60. Facial soft tissues are organized into four concentrated tissue layers (1st skin; 2nd subcutaneous fibroadipose layer; 3rd superficial musculo-aponeurotic system (SMAS); 4th parotid-masseteric fascia). Biological aging of the face is the result of the complex interaction of these layers and structural changes in bone and displacement caused by the effect of gravity. Age-related changes vary according to functional regions and processes, and there is no uniformity. These changes are more prominent in the anterior part of the face than in the lateral part due to the structural and functional properties of the tissues (13). It has also been proven by MRI studies that dramatic changes in the soft tissue of the face occur between the ages of 30 and 60 in the temporal, infraorbital, lateral cheek and medial cheek regions (2, 14). In our study, which included individuals aged 15 to 65 years, 99% of the participants were young individuals (under 65 years of age). Participants were average (6.04±2.06/10) satisfied with their facial and neck appearance. They were not satisfied with the appearance of the eye area, cheek area, nose area, neck, forehead and lip area, respectively. This ranking is concordant with the structural features of the face, as well as the opinion of most people around the world that the eye area is the most important component of facial beauty (15).

Theories of facial aging largely focus on changes in the skin and subcutaneous fat and bone, while the role of muscles in aging has often been neglected (16). Facial aging occur at all soft tissue levels. Loss of elasticity in the skin is accompanied by a decrease in dermal thickness and vascularization. Fat redistribution contributes to the physical properties of loose and sagging skin (17). The superficial muscles in the face's soft tissue are located in the third layer (SMAS). SMAS, associated with the skin through connections in the subcutaneous layer, is muscular only where movement occurs (13). Wrinkles, which are signs of aging on the skin, are defined in two main types' dynamic (mechanical wrinkling of the skin by uncontrolled contraction of the underlying skeletal muscles) and static (wrinkles that occur secondary to volumetric tissue loss) (18, 19). In dynamic skin wrinkling, it appears as expression lines, the shape and depth of

the wrinkle are related to the repetitive contraction of the muscles, and the wrinkle disappears when the muscles relax. It is a static or permanent skin wrinkle that occurs in the early 30s regardless of muscle relaxation and increases in severity with aging. The transition from dynamic to static skin wrinkles may result from frequent muscle contractions and permanent wrinkles may progress with the aging process (18, 19). In this study, 63% of the participants thought that the signs of aging on the face and neck were caused by the skin, and 76% (weakness, 56%; overtraining, 20%) were of the opinion that the muscles were caused.

There are internal and external factors that affect the aging of the face. Inevitable intrinsic factors are heredity and various cellular and molecular processes programmed into the individual. External factors that also affect internal aging are individual habits, diet and environmental factors (4). In this study, it was determined that daily water consumption was frequently (63%) paid attention to, but practices that were directly related to income (regular sun protection, balanced diet, and medical and/or cosmetics) were less preferred (49%, 41%, 46% respectively). Among the habits aimed at delaying facial aging, the least preferred exercises were (32%). Although the aging process of female and male faces is similar with some exceptions, female participants preferred all applications at higher rates (female, 83-94%; male, 6-17%). Those who were active in business life and students had these habits more than housewives and retirees. The reason for the decrease in these habits, especially in participants aged 55 and over, may be economic inadequacy, increased health problems, difficulty in using technology and reduced social communication. These preferences were affected by occupation, education, gender, age and income level, respectively.

There are many non-invasive, minimally invasive and invasive approaches based on maintaining the natural and harmonious balance of all components of the facial structure for optimal facial rejuvenation (4, 6, 8-11, 15, 20). Our study population was highly aware of facial rejuvenation expression (82%) and was willing to budget their income (77%) to have healthy youthful skin. Regardless of income, this preference of females, university graduates and health workers was statistically significant ($p<0.001$).

Skin cleansing, moisturizing, facial massage, facial exercises and facial yoga are non-invasive facial rejuvenation methods (8). Skin resurfacing peels, injected neurotoxins, dermal fillers, lasers, facelifts, facial acupuncture are frequently used minimally invasive aesthetic procedures. These methods are treatments with minimal downtime, unlike surgery for fine lines, sun damage, uneven pigmentation or tissue problems on the face (8, 20). Invasive methods can be listed as brow lift, eyelid surgery, face tightening, and rhinoplasty (15). According to our study results, the awareness of the practices was as follows; 69-81% from cream-tonic, mask, facelift, facial exercises/facial yoga, 59-64% from dermal fillers, massage, BTX, brow lift, eyelid surgery, and 37-50% from chemical peels, facial acupuncture, laser therapy, mesotherapy, PRP application. Females highly preferred all methods. Creams and tonics, masks and facial exercise/facial yoga and BTX were chosen statistically significantly higher by women ($p<0.05$). Significant differences were found in the preference of creams and tonics, masks, BTX, dermal filler, mesotherapy, PRP and facial acupuncture according to education ($p<0.05$). It is reported in the literature that people with low education mostly prefer invasive procedures (21), while people with high education prefer minimally invasive procedures (22). In our population, minimally invasive procedures were found to be preferred at higher education. There was no significant difference in the preference for eyebrow lift and eyelid surgery, which are invasive methods. From the answers given to the facelift application, which is one of the invasive methods, it was concluded that the problem was not fully understood.

Mimic muscles are the component of facial SMAS. This system is a single tissue plane that is not directly connected to the bone, consisting of muscle fibers and connective tissue depending on the region. It is continuous with some mimetic muscles (including the periorbital fibers of the zygomaticus major, frontalis, and orbicularis oculi) anteromedially of the face and is indistinct on the lateral side of the face about 1 cm below the level of the zygomatic arch. Just lateral to the buccal angle on both sides of the face is the modiolus, a dense, compact, mobile, fibromuscular mass formed by the fusion of at least nine muscles. Major modiolar movements involve most, if not all, of the associated muscles (13). The origins of mimetic muscles are usually found in bone, except for sphincteric muscles, and, unlike skeletal muscles, they insert into the skin and between fibers of other muscles without any tendons (16). Although these muscles are independent in terms of innervation and function, they form a continuous layer thanks to their connections with facial muscle and ligament components. Both the continuity of the SMAS and the modiolar movements may suggest that it is of little value to consider the movements of individual muscles separately. Biting, chewing, drinking, sucking, swallowing, speaking, shouting, screaming, modulation of musical tones, crying, and the control of modioles in all permutations of facial expression integrate the activities of the cheeks, lips, oral opening and jaw (13).

In clinical practice guidelines for the face, especially eyebrow-raising and lowering muscles are included (16). However, it has been reported that functional muscles contribute to the appearance of the entire face, not just the eyebrows, and shape the jawline in particular (2, 8). Alam et al. (2018) found that individuals who participated in the facial exercise program they applied looked approximately 2.5 years younger than the baseline. It is known that long-term massage application improves the blood flow to the skin with vasodilation in the veins, thus increasing collagen production and providing a taut and bright appearance on

the skin (23). It is becoming more and more important for young individuals to have a symmetrical face and to reflect their emotions with a correct facial expression, and to raise awareness that the lost facial balance can be regained for older individuals (5). With this study, the population that is aware of the age-related changes in the human face and neck and is interested in delaying these changes and/or facial rejuvenation applications was reached, and the awareness of this population about facial exercises was investigated among other applications. Although 86% of the participants had heard of facial exercises/facial yoga for facial rejuvenation before, only 23-35% stated that they applied it. When the preference for facial exercises and face yoga was questioned by listing it among other methods, a statistically significant effect of gender (p, 0.004) was detected, while when questioned with a separate question, no significant effect of socio-demographic characteristics was found. Especially between the ages of 25-34, university graduates and middle-income females were using these methods. The rate of regular practice was quite low (8%). 71% of the participants had learned about these practices from social media. The effect of facial exercises/face yoga on facial rejuvenation was scored as 7±2.06 out of 10.

Most of the participants (75%) were unaware of the benefits of facial exercise and facial yoga other than facial rejuvenation. A young, beautiful and attractive appearance has a positive effect not only on the self-confidence of individuals but also on social behaviors and communication (3-5). In addition, these exercises help vocalists control their voices and make music at the pitch they want, and instrumentalists make a healthier and more appropriate sound from the instrument (24). Smile aesthetics and/or smile design are popular dental procedures today. In determining the smiling behavior, perfect upper incisors, young and pleasantly curved lips and lip commissures, as well as the contractility of the perioral muscles and their morphological characteristics are very important (25). Therefore, although evidence is needed, facial exercises can complement smile design procedures.

Limitations

Since this survey study was planned during the active period of the Covid-19 pandemic, it could not be applied face-to-face. Despite the pre-test, some of the applications were not fully understood by the participants. The elderly population could not be reached in sufficient numbers.

CONCLUSION

The Covid-19 pandemic, which has affected the whole world, has also shown that it is very valuable to gain habits independent of income and others in order to protect the health of the body and face. Unlike cost and time-consuming cosmetic procedures to preserve and restore facial youthfulness, facial exercises are free and almost certainly not harmful. However, there is not enough evidence and randomized controlled studies about the benefit of facial exercises for facial rejuvenation. According to the results of this study, all people, especially males (who are exposed to facial aging as much as females), individuals out of active working life, and individuals with low education, should be informed by health professionals about face exercises/face yoga. Facial exercises, which reduce the need for invasive methods and decelerate facial aging when applied correctly and regularly together with other non-invasive methods, should be applied in the presence of trained and experienced trainers and should be made a habit early.

** The preliminary results of this study were presented orally at the "International Medical Records Congress" in 2021.

Financial disclosures: *The authors received no support from any financial institution or organization for this study.*

Conflict of Interest: *The authors declare that they have no competing interest.*

Ethical approval: *This study was approved by the non-interventional clinical research ethics committee (approval number 3359/2021).*

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