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ANTIQUÉ – MODERN: MASTICATION REEDUCATION IN OBESITY RECOVERY

Case
study

Keywords

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JEL Classification

Z00

Abstract

Mastication reeducation is one of the ways of body remodeling, that can be used in the obesity recovery. In antique Greece, this kind of exercises were practiced in Palestra (gymnastics, sports and sporting competitions schools and arenas). "Besides, Palestras teachers recommended to the athletes to chew well and at leisure, to gain more power, instead of swallow in the greedily eating way, without chewing. therefore, one of the regular exercise, in the Palestra, is chewing food. ". At present, a study showed that the evolution of the fat percentage, as part of body composition, was significantly positive for the experimental group subjects. Mastication reeducation physical exercises are ways to understand, appreciate and to keep healthy the own body.

Juvenal, in his "Satire 9", said: "*orandum est, ut sit, men sana in corpore sano*" ("We must pray to have a healthy mind into a healthy body"). But is not enough to pray, we need the knowledge to. The spiritual, the divin can embody into the knowledge, into the science.

One way to obtain a healthy body is, also, the way in that we accomplish mastication. Digestion begin with this act: mastication. In a way, modern society forces us to eat "fast", to find the time to solve all our problems. But using bad quality nutrition (in deed, but, also, qualitatively and quantitatively), self-harm us: obesity pandemic pathology is source and / or support for the most human diseases. Mastication reeducation is just an element in the struggle against the development or for therecovery (by correcting body composition components) of obesity.

Since ancient times, mastication education was part of the fight arsenal for a healthy body. In antique Greece, this kind of exercises were practiced in *Palestra* (gymnastics, sports and sporting competitions schools and arenas). **Philon of Alexandria** said: "*Besides, Palestrasteachers recommended to the athletes to chew well and at leisure, to gain more power, instead of swallow in the greedily eating way, without chewing. therefore, one of the regular exercise, in the Palestra, is chewing food.*"

In the period January to December 2014, was developed a study on obesity recovery. The study was conducted in the Emergency Hospital "St. Pantelimon", Bucharest, on two study groups: 50 subjects in the experimental group and 50 subjects in the control group. The study focused on obesity recovery by body remodeling, expressed by elements of body composition. Using, as a basic principle, the interdisciplinary teamwork, the study was conducted on several levels: physiotherapy, medicine, dietetics, psychology and sociology. Into the physiotherapeutic program can be found mastication and deglutition exercises.

Mastication reeducation should be performed under mental and environmental comfort, and with compliance the rules of food hygiene. Those means physical exercises which help subjects to practice a proper mastication act and to transform the correct mastication into a reflex.

General framework for these exercises development:

- the subject feeding will not be disturbed by other activities (walking, driving, reading, working, etc.);
- favorable environmental conditions, during feeding (quiet, clean, relaxing music if is possible, airy space, pleasant colors);
- foods prepared in uncertain conditions will be removed from the diet;
- the food will be fresh, tasty and showy;

- the food will be portioned in small quantities, to make them easy to chew.

Physical exercises performed during the study, for the mastication and deglutition reeducation purpose:

1. Exercise I - masticating chewing gum:

It is used three times per day (in principle, before meals), no more than 10 minutes. Masticatory muscle contraction is performed in 2-3 seconds (until the close contact of the molars), maintaining the contraction for two seconds and the jaw muscles will be relaxed (up to remoteness jaw) for 2-3 seconds, followed of a pause of two seconds. Three mastication will perform by molars – premolars from the left side, three from the right side and two masticating with incisors teeth.

By using all teeth in the masticating act, should be prevent the one side teeth depreciation, thereby contributing to the prevention of dental disease.

2. Exercise II – water mastication:

The chewing gum will be replaced with water before the main meals (three times / day). This technique is the same as that described above (replacing the chewing gum with water).

3. Exercise III - solid food mastication:

Using the technique described above, but this time with solid foods, the food will be masticated until it will turn into a paste (favoring the deglutition and the digesting itself).

4. Exercise IV - Breathing (during feeding) reeducation, is a very important technique in mastication and deglutition reeducation, inducing a mastication and deglutition rhythm and contributing to the better food preparing for digestion.

a. with gum - Thus, given that the masticatory cycle (as described above) takes 8-10 seconds, one masticatory cycle will correspond to inspiration and next masticatory cycle, to expiration.

b. during mastication - just like respiratory reeducation described above (using chewing gum), but using water and solids.

c. during deglutition - a phase of digestion less discussed, but with great importance. Breathing reeducation during deglutition it is used to set a rhythm of eating and digestion and, also, to prevent the accidents that may occur during this stage. So, after getting, through mastication, the pasta food, the subject inspire and maintain in a inspired air break, achieving in this time deglutition, following expiration, 1-2 seconds after deglutition.

The results obtained at the end of this study, are not only because of mastication reeducation exercises, but combining all interdisciplinary therapy elements, which were targeted one the body remodeling. Instead, these physical exercises had helped to correct the body composition of the study subjects.

The somato - functionally recovery program was structured by 56 days, during which were evaluated the subjects of both study groups. The experimental group subjects were evaluated

periodically at an interval of 10 days and subjects of study group in the first day, on the 28th day on the last day of the program, the 56th day.

For this reason, the comparative evaluations between the subjects of the two study groups were:

- Initial (first day of the program)
- Intermediate (on the 28th day);
- Final (the last day of the program, the 56th day).

Measured values of anthropometric parameters (of body composition) were recorded individually, for each subject, and summarized as medium values of each study group.

Table 1

The reference used in individual assessment of the evolution of the two study groups subjects was "standard scale percentage of adults fat".

Figure 1

The each subject fat percentage evolution was monitored and by using the obtained values on this scale (shown above).

In terms of statistical analysis:

1. The fat percentage evolution of the two study group subjects is significantly quantitative positive for the experimental group subjects:

Table 2

Table 3

2. The variation coefficient of the fat percentage for the two study group subjects is an statistical control element for the groups composition:

Table 4

So, values of the variation coefficient reported between 4.07 - 9.43% means that the study groups are representative, through their high degree of homogeneity.

3. In the fat percentage variation for the two study groups subjects, the **Pearson** correlation coefficient it was:

Table 6

The Pearson coefficient being (at all stages) less than 0.001 ($p < 0.001$), means a very highly significant statistical relationship, with a 99.9% confidence level.

Finally, the study hypothesis (body remodeling, expressed by body composition elements) was confirmed, and the null hypothesis, disproved.

The mastication reeducation by physical exercises, were structural elements of the study and used for the purpose of the body remodeling. Anyhow, anyone who wants a healthy lifestyle can practice this kind of exercise. Because, concluding, these mastication reeducation physical exercises are ways to understand, appreciate and to keep healthy the own body.

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Table 1 – Centralized table of the anthropometric parameters monitored in the two study groups

no. crt.	Measured parameters	Initial evaluation		Intermediate evaluation		Final evaluation	
		EG	CG	EG	CG	EG	CG
1.	Weight (kg)	107.748	104.6	98.624	102.2	89.016	102
2.	Skin fold(mm)	4.1	4.12	3.2	4.08	2.6	4.04
3.	Body density	1.019061	1.018738	1.02885	1.019001	1.039028	1.019259
4.	Fat percentage (%)	35.5426	35.684	30.924	35.558	26.204	35.4368
5.	Fat mass (kg)	38.39408	37.36878	30.60032	36.38244	23.4201	36.18909
6.	Non-fat mass (kg)	69.12408	67.00335	67.77367	65.59407	65.37045	65.58934

where: EG - experimental group
CG - control group

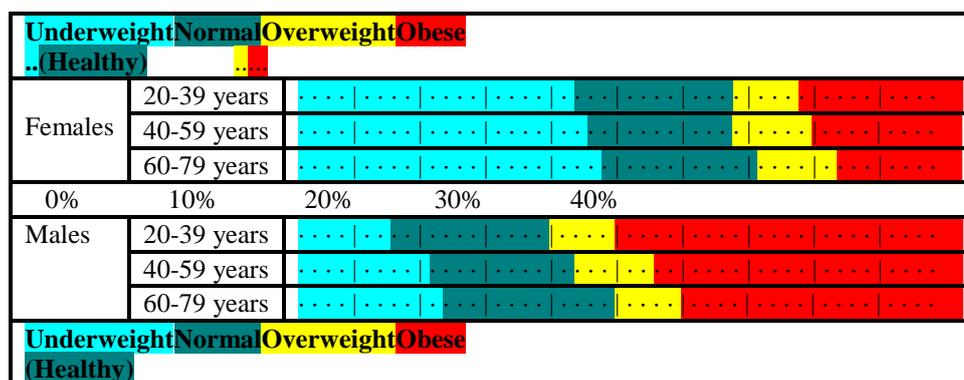


Figure 1 - Standards percentage of adults fat

1. Written on NIH Guide / WHO BMI
2. Presented by "Gallagher et al" to "NY Obesity Research Centre"

Table 2 – Centralized table of the fat percentage - experimental group

Experimental group subjects	Initial evaluation	Intermediate evaluation	Final evaluation
Males	41.36	31.40	26.64
Females	35.69	30.98	26.30

Table 3 – Centralized table of the fat percentage - control group

Control group subjects	Initial evaluation	Intermediate evaluation	Final evaluation
Males	35.91	35.80	35.65
Females	35.25	35.09	35.02

Table 4 – Centralized table of the variation coefficient of the fat percentage – experimental group

Experimental group subjects	Initial evaluation	Intermediate evaluation	Final evaluation
Males	5.91	7.90	8.84
Females	5.39	8.13	9.43

Table 5 – Centralized table of the variation coefficient of the fat percentage – control group

Control group subjects	Initial evaluation	Intermediate evaluation	Final evaluation
Males	4.07	4.18	4.33
Females	5.16	5.31	5.22

Table 6 – Centralized table of Pearson coefficient

	Initial evaluation	Intermediate evaluation	Final evaluation
Pearson coefficient (p)	0.0000006639	0.0000000198	0.0000002418

