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Original articles

Experience of speech pathology and nutritional monitoring of oral feeding in older people from a community-based approach

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ABSTRACT

Purpose: to describe the changes in the body composition and swallowing of an older-people group from a community-based speech therapy and nutrition program.

Methods: a pre-experimental study of a single group was carried out, with prospective timing and pre-post evaluation for three months. The Body Mass Index (BMI), percentage of body fat (%BF), percentage of muscle mass (%MM), percentage of visceral fat (%VF), swallowing performance, and Swallowing Quality of Life (Swall-QoL) were evaluated. The Spearman correlation coefficient and the Mann-Whitney U test were used, significance level $p<0.05$.

Results: 13 older people participated in the study. The average age of the group was 73.8 years (SD= 4.6). The BMI (pre=28.17; post=28.38), %BF (pre=38.5; post=38.7), %MM (pre=24.8; post=24.9) and %VF (pre=14.3; post=14.8) did not present significant differences ($p>0.05$). The scores obtained in the deglutition test was pre=19.15 and post=18.9. An association between BMI and VF (Rho=0.74; p=0.02) was detected.

Conclusion: the program represented a community-based instance of health promotion focus on oral feeding of older people.

Keywords: Deglutition; Aging; Speech-Language Pathology; Eating; Nutritional Sciences

INTRODUCTION

Aging represents a social phenomenon[1] characterized by anatomical, physiological changes that increase the susceptibility of the elderly to risk factors that can affect their health[2]. As of 2013, there were 2,855,157 people over 60 years old[3] in Chile, and this number seems to be increasing as a result of the growing life expectancy of this population[4].

Studying the phenomena that affect this group's health and quality of life is a priority issue for all countries[5]. Older people notice a generalized deterioration of systems that can affect functions such as food intake, an act that, if compromised, can be life-threatening[6].

Swallowing is a complex process that involves voluntary and reflex behaviors, its purpose is to move food from the mouth to the stomach[7], and it is a relevant activity for the maintenance of life[8].

As age advances, physiological changes in the body composition happen, which can impair swallowing[9], resulting in an increased risk for the development of swallowing disorders[10].

The body composition changes during life, first increasing and then stabilization and/or decrease in senescence[11]. These changes are dynamic and can mimic some conditions that become pathological[11], such as pre-sarcopenia and sarcopenia. Sarcopenia is defined as a decrease in skeletal muscle associated with age, contributing to the loss of independence in older people[12]. *Sarcopenia* can affect complex functions such as swallowing through a condition that has been defined as sarcopenic dysphagia. *Sarcopenic dysphagia* is a phenomenon observed in some people aged 60 years or older, and it is defined as a swallowing difficulty associated with the loss of mass, strength, and functionality of the general musculature and that associated with the act of swallowing, which can compromise the quality of life and the vital state of the subjects[13].

The quality of life has different dimensions, associated with a satisfactory life situation and the subjective perception of well-being, positive self-assessment, and belonging to a group or community[14]. The literature indicates that there is a link between body composition and dysphagia in older people[15]. Swallowing disorders can affect people's quality of life, noticing that the act of swallowing has a social dimension that finally occurs within a human group or community and that its condition can compromise those who suffer from some type of disorder[16].

Additionally, it is interesting to consider the community-based rehabilitation approach as an ideal strategy to approach human groups in a collaborative social context[17]. This perspective offers a way of connecting with people, not from the hierarchical relationship of the biomedical model, but from an integrating position that recognizes the reality of the territory and its inhabitants, as a source from which a two-way relationship can be started[18].

The objective of this research was to describe the changes generated in the body composition and swallowing of a group of older people from a community-based program of speech and nutritional support.

METHODS

This research was approved by the Scientific Ethics Committee (SEC) of Santo Tomás University, Chile, with code 18.18. Additionally, informed consent was available through which the participants authorized their free and voluntary participation in the study.

A single-group pre-experimental study was carried out, with prospective timing and pre-post evaluation[19]. The intervention activities included group instances of approach and speech therapy education, execution of workshops to prepare food minutes, and actions to stimulate the muscles related to swallowing according to a weekly topic (Appendix 1).

The universe consisted of 15 older people belonging to a Neighborhood Council of the Los Limonares community in Viña del Mar, Fifth Region of Valparaíso, Chile. The sample size calculation was performed with the G * Power 3.1[20] Software considering an effect size of 0.9, error of 0.05 and power 0.95, estimating a necessary sample of 15 subjects. The inclusion criteria were the absence of a moderate or severe swallowing disorder after triage assessment with the Gugging Swallowing Screen (GUSS)[21], age equal to or greater than 60 years, and the signing of the informed consent. The exclusion criteria were reduced mobility, physiological instability due to uncontrolled pathologies, neuropsychological or mental disorder that disabled the person to follow instructions.

The variables of interest related to body composition were body mass index, percentage of visceral fat, percentage of body fat, percentage of muscle mass and grip strength. Concerning swallowing, the following were evaluated: phonoarticulatory organs, swallowing performance, and quality of life associated with swallowing.

To collect the information, the Gugging Swallowing Screen (GUSS)[21], Swallowing Quality of Life Questionnaire[22], bioimpedance meter (Bodystat 500), DM001 digital dynamometer, and a self-created guideline for the evaluation of phonoarticulatory organs were used. The said guideline included the clinical assessment of speech-articulatory structures, symmetry, mimicry, and facial typology, and a tactile assessment of the facial muscles carried out from a qualitative assessment by a trained clinical speech therapist.

As a first step, community leaders were contacted to access older people in the territory respectfully. Once the links were generated, the project's scope was shared with the group, managing the informed consents communication, and offering reasonable times for their review, signature, and return.

The follow-up period considered an initial and a final assessment and ten weekly workshops, in sessions of approximately 60 minutes, for three months during 2018.

Descriptive and non-parametric inferential statistics were used, particularly Spearman's Rho and Mann Whitney's U, considering a significance level of $p < 0.05$. The data obtained were tabulated in Microsoft Excel 2010 and subsequently analyzed in Graph Pad Prism 5.0.

RESULTS

The group of older people was evaluated by professional speech therapists and nutritionists-dieticians, identifying a total of 13 subjects that made up the final sample. The description of the participants is detailed in Table 1, highlighting an average age of 73.8 years old (SD = 4.6). 67% of the participants corresponded to females, and 44% of the individuals were overweight. Most of the people (92.3%) had a removable prosthetic implant.

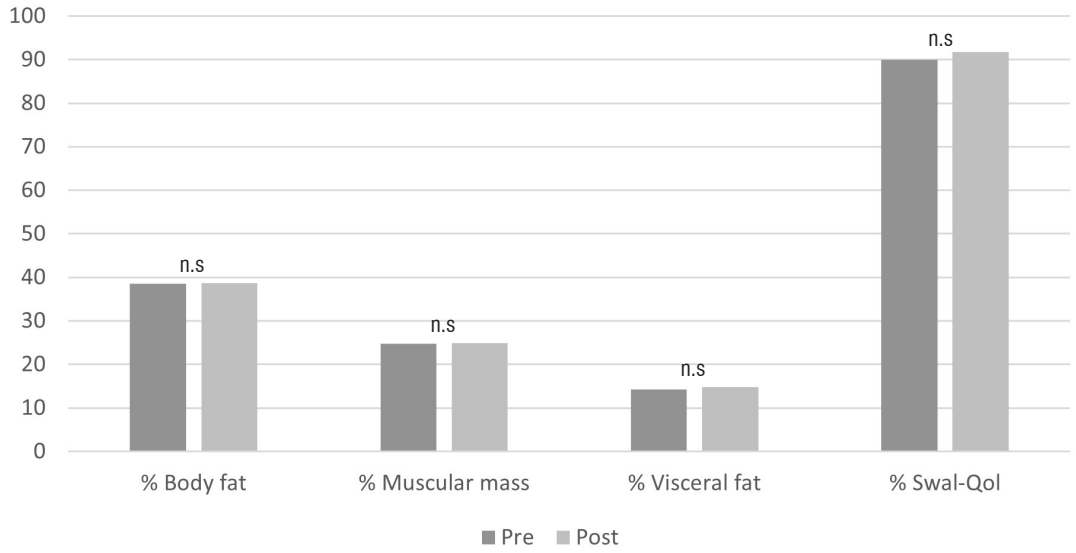
Table 1. Characteristics of the Single Group

Parameter	Outcome					
Age	Average	73	Min	64	Max	81
Gender	Female	67%	Male	33%	non determined	-
Height	Average	1.55 m	Min	1.44 m	Max	1.68 m
Weight	Average	69 kg	Min	48.5 Kg	Max	95.3 Kg
BMI	LW 12%	NW 22%	OW 44%	OB 22%	-	-
Facial structure	Mesofacial	84.6%	Dolichofacial	7.7%	Brachyfacial	7.7%
Facial symmetry	Normal	92.3%	Altered	7.7%		
Upper dental arch	NP	7.7%	WP	92.3%		
Lower dental arch	NP	7.7%	WP	92.3%		

Captions: Aver= average; Min= minimum; Max= Maximum; BMI= Body Mass Index
LW= Low Weight; NW= Normal Weight; OW= Overweight; OB= Obesity; NP= No Prosthetics; WP= With Prosthetics.

The body mass index (BMI), the percentage of body fat, the percentage of muscle mass, and the percentage of visceral fat did not register statistically significant differences between both evaluation times ($p > 0.05$) (Figure 1).

Regarding the swallowing act, a standard assessment was observed in the participants from the screening test (GUSS); therefore, no instrumental evaluation was required, noticing scores higher than 18 for both times. The quality of life associated with swallowing (Swal-Qol) showed a slight increase that was not significant (Table 2).



Captions: Swal-Qol= Swallowing Quality of Life Questionnaire. U de Mann- Whitney test. n.s.= non significant ($p > 0.05$).

Figure 1. Body composition and quality of life associated with swallowing

Table 2. Comparison of nutritional parameters and swallowing screening

Parameter	Pre	Post	p-value
BMI	28.17	23.38	0.92
Grip Strength	15.7	16.7	0.47
GUSS	19.15	18.9	0.3

Captions: BMI= Body Mass Index; GUSS= Gugging Swallowing Screen. U de Mann- Whitney test. *$p < 0.05$.

33% of the sample had a high percentage of body fat, and 67% were categorized as having very high body fat for their gender and age. The association analysis detected a direct and statistically significant relationship between BMI and visceral fat (Rho = 0.74; p = 0.02). A slight change was observed regarding grip strength before and after the intervention; both measures were below the 25th percentile for both hands, with an average score of 15.7 and 16.7, respectively (Table 2).

DISCUSSION

The body composition, nutritional status, and swallowing in older people are relevant health dimensions to address for the identification, screening, and prompt treatment of aging-related symptoms and the possible effects these may have on the well-being and quality of life of this population[23]. The nutritional profile observed in the elderly in the studied community agrees with the nutritional status due to excess reported in the National Health Survey in 2017[24], with a prevalence of overweight greater than 60% at a national level.

This study showed that, despite an increase in body and visceral fat, with a decrease in lean mass, no related swallowing complaints were noticed in the evaluated users. Likewise, a slight decrease was noted in the GUSS screening test scores (Table 2). This may be due to excellent knowledge that people had regarding swallowing after monitoring. Likewise, it was observed that the experience, although it did not generate significant changes in the health fields evaluated, it did not deteriorate them.

Recent studies referring to the comprehensive approach to nutrition in older people have focused on evaluating the effectiveness of exercise-based interventions and a nutritional approach to prevent sarcopenia, demonstrating that these proposals have good acceptability in the population[25]. For example, a 6-month nutritional program aimed at the elderly can increase protein consumption by subjects living in adult communities[26], and nutritional interventions in sarcopenia can prevent muscle loss in individuals undergoing intervention[27]. In line with the increase in the functionality of the elderly, a

type III randomized controlled clinical trial reported that a program that included nutritional counseling, physical activity, dietary intervention, and the use of technologies was cost-effective versus an education program focused on promoting healthy lifestyles and aging[28].

The specialized literature mentions that the comprehensive approach of swallowing in the elderly from the nutritional and speech therapy perspectives has made it possible to prevent, diagnose, treat, and rehabilitate the processes involved in oral feeding. These aspects turn out to be essential for the maintenance of life[29].

Thus, the need to review the use and application of the concept of integrality is noted when it comes to approaching the elderly. It is necessary to incorporate different perspectives and areas of intervention that can impact the health status of the intervened subjects in the medium and long term.

It is necessary to design support programs where the times and areas of intervention, frequency, and monitoring of the population studied can be increased[30,31] to show changes in the body composition and thus demonstrate the effectiveness of a comprehensive approach through studies that consider a more extensive population base and incorporate control groups.

On the other hand, it highlights the need to strengthen instances of health education in groups of older people who consider the reality of the territories. This aimed at empowering the subjects regarding the control of their own health.

The community and comprehensive approach towards older people has not been previously described at the local level, and seems to represent an instance for promoting health and preventing disorders in individuals who can be susceptible to risk.

The limitations observed in this study are the lack of an instrumental evaluation of swallowing that complements and objectifies the clinical assessment carried out, particularly regarding the state and functionality of the muscles involved in the process. Likewise, it is crucial to interpret the findings cautiously considering the methodology used, the final number of participating subjects (losses), and the follow-up time.

Given the epidemiological profile of the Chilean population[32], it is necessary to strengthen research in areas that contribute to maintaining the functionality and autonomy of the elderly, aligned with the country's health objectives[33], to avoid the development of symptoms and / or disorders that may compromise the vital status and quality of life of the elderly. In this sense, the study of sarcopenia[12] and its implications from nutrition and speech therapy[34] will represent a promising research area for future projects.

CONCLUSION

The community-based speech therapy and nutritional monitoring described did not generate statistically significant changes in swallowing or nutritional aspects of the intervened group. The maintenance of the parameters studied in the elderly for the study's execution period was noticed. The comprehensive approach of oral feeding of older people without clinical symptoms represents an opportunity for health promotion and prevention of disorders associated with swallowing.

Likewise, it is an instance where it is possible to educate about the changes inherent to aging and identify signs that may require consulting a specialist or a health center. The community approach offers a scenario where accompaniment actions are designed to consider the needs of the population. The experience presented turned out to be a health-promoting instance within a community context, incorporating educational aspects and intervention at the individual and group level, helping to maintain functions that promote safe and effective oral feeding.

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APPENDIX 1. ACCOMPANIMENT PROGRAM

Week	Activity	Detail	Responsible professional
1	Initial assessment	• PAOs Evaluation • Swallowing screening (GUSS) • Evaluation of Swallowing Quality of Life (Swal-Qol) • Evaluation of the body composition: Height, Weight, Bioimpedanciometry	Speech Therapy and Nutrition
2	Approach	• Oral health and hygiene workshop	Speech Therapy
3	Approach	• Educational workshop on chronic non- transmissible diseases	Nutrition
4	Approach	• Swallowing physiology and muscle exercises workshop (isotonic and isometric)	Speech Therapy
5	Approach	• Healthy minute preparation workshop	Nutrition
6	Approach	• Postural techniques workshop	Speech Therapy
7	Approach	• Preparation workshop with products from the complementary feeding program for the elderly (CFPE)	Nutrition
8	Approach	• Workshop on the adaptation of utensils for food	Speech Therapy
9	Approach	• Workshop on food portions in homemade measures and nutritional labeling	Nutrition
10	Approach	• Educational workshop on essential nutrients, water, and hydration	Speech Therapy
11	Approach	• Workshop on consistency adaptation and food handling	Nutrition
12	Final Assessment	• PAOs Evaluation • Swallowing screening (GUSS) • Evaluation of Swallowing Quality of Life (Swal-Qol) • Evaluation of the body composition: Height, Weight, Bioimpedanciometry	Speech Therapy and Nutrition

Captions: PAOs = Phonoarticulatory Organs; GUSS= Gugging Swallowing Screen; Swal-Qol= Swallowing Quality of Life Questionnaire.