The Effect Of Facial Exercise On The Amount Of Salivary Secretion In The Elderly At The Mandiangin Health Center Bukittinggi City

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ABSTRACT

Background: *Elderly (elderly) is one of the phases in human life. There are several changes in body and organ function, one of which is a decrease in oral cavity function such as decreased saliva production. Decreased saliva secretion will cause poor oral conditions. One way to prevent this is by doing facial exercises. Facial exercises can stimulate salivary secretion and oral function.*

Method: *Quasi-experimental research method with one group pre test post test design. The sampling technique used Purposive sampling with a total sample of 78 samples where the subject spat out saliva 2 times before facial exercise, then performed facial exercise, the subject fasted for one hour and the subject was asked to spit out saliva again 2 times.*

Result: *The results of this study were analyzed using the Wilcoxon Signed Ranks Test. The gender of respondents was mostly female as many as 68 people (86.1%), while male respondents were 11 people (13.9%), the average age of respondents in this study was 65 years with the most respondents aged 68 years, the average salivary secretion before facial gymnastics 1.11 ml and the average after facial gymnastics 1.62 ml the results of statistical analysis of significance p value 0.001 ($p < 0.05$) indicates a significant difference between the amount of salivary secretion before and after doing facial gymnastics.*

Conclusion: *The conclusion of this study is that facial exercises have an effect in increasing the amount of saliva secretion in the elderly.*

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INTRODUCTION

Every human being will experience something called growing old or aging, which is a natural process where there is a slow decline in the ability of tissues to repair themselves, resulting in physical, mental, and social decline. Aging or more commonly referred to as elderly is one part of the process of human growth and development. [1] According to Law No. 13 of 1998, an elderly person is someone who has entered the age of 60 years and above (Ministry of Health, 2019).[2] Based on data from the Central Bureau of Statistics, the number of elderly people in Indonesia in February 2022 was 29,165,461 with more elderly women than men.[3] The number of elderly people in West Sumatra Province based on data from the Central Statistics Agency in 2022 amounted to 629,493 people with male sex elderly totaling 285,412 people, female sex totaling 344,081 people. [3] The data from the Central Statistics Agency in 2022 stated that the number of elderly people in Bukittinggi City was 12,664 people with male elderly totaling 5,858 people and female sex totaling 6,806 people. [3]

The elderly are synonymous with decreased endurance and experience a variety of health problems.[4] Oral health in the elderly will also experience a decrease in function. Decreased oral function in the elderly has an impact on weakening the masticatory muscles and will result in decreased chewing power which causes the chewing process to not be optimal so that it affects the fulfillment of nutritional needs for the elderly themselves. Unmet nutrition will have an impact on health problems later.[5]

Another thing that cannot be ignored in the elderly is the decrease in salivary productivity. Saliva is a thick liquid produced by the salivary glands in the oral cavity.[6] Salivary glands have a very important role in maintaining the ecosystem in the oral cavity. The nature of saliva is to form a mucosal layer that can protect the mucosa from bacterial infection.[7] Saliva will work optimally when saliva production increases. The elderly often experience impaired salivary flow.[8] One of the effects of impaired salivary production is xerostomia or dry mouth. Xerostomia is a subjective complaint due to changes in consistency or decreased saliva production, also known as hyposalivation.[9] Elderly suffering from xerostomia generally experience difficulty in speaking due to dry lips and speaking due to dry lips and the sensation of the tongue sticking to the palate. Chewing and swallowing are also affected, with the oral mucosa becoming sensitive or even painful.[10]

Treatment of xerostomia in the elderly can be in the form of non-pharmacological and pharmacological treatments. Non-pharmacology in the form of artificial saliva and alternative treatments such as acupuncture and electrical stimulation.[11] Pharmacological treatments such as the use of parasympathomimetic drugs, pilocarpine, bethanechol, carbachol, cevimeline and methacholine. These drugs can stimulate increased saliva secretion. [12] However, pharmacological treatments have several side effects, common side effects include nausea, vomiting, diarrhea, abdominal cramps, bronchoconstriction, and hypotension.

Pharmacological treatments also aggravate symptoms of COPD, asthma, and peptic ulcer disease in susceptible individuals.[13]

One way to increase saliva production is to do facial exercises, facial exercises themselves have no side effects. Facial exercises is a reflection of the muscles of the face and oral cavity that can stimulate the facial muscle nerves and improve motor function in the oral cavity.[8] According to Utami and friends in 2023, facial exercises is making repetitive movements and exaggerated expressions to activate and build muscles.[14] Facial exercises can significantly affect salivary stimulus. Facial gymnastics is the act of giving massage to the facial area from top to bottom around the cheeks, mouth and chin, this activity is expected to stimulate saliva secretion and oral cavity function.[5]

RESEARCH METHOD

The type of research used in this study is quantitative research using quasi-experimental methods. The research design used is one group pre test post test design. This research design is to compare the situation before and after the researcher provides treatment. The subject group was observed before being given the intervention, then observed again after being given the intervention.

Population is the entire research object of the object to be studied. The population in this study were the elderly at the Campago Ipuah Elderly Posyandu, totaling 338 people. Sampling in this study using purposive sampling method. Purposive sampling is a sampling technique using certain considerations in accordance with the desired criteria. Determination of the number of samples was carried out using the Slovin Formula with a sample size of 78 people.[14]

The inclusion criteria in this study the elderly aged 60-69 years, willing to be involved in the study, residing in the Mandiangin Health Center working area, able to communicate in 2 directions. Exclusion criteria in this study are elderly who have experienced head and neck trauma, elderly who have hearing, vision and speech impairment, elderly who have upper extremity paralysis, elderly who take drugs that cause xerostomia such as antihypertensive, anticholinergic, and other drugs.

The location and time of this research will be carried out at the Mandiangin Bukittinggi Health Center. This research was conducted from November 2023 to January 2024. The tools used in this study are 20 ml disposable measuring cup, stopwatch, pen, mask, handscoon, tissue. the materials used in this study are informed consent, observation sheet.

This study will be conducted by, The research subject is directed to collect saliva in the mouth and then spit saliva twice and will be collected and recorded. Subjects will perform facial exercises that will be demonstrated by the researcher, facial exercises are carried out together

by sitting in a chair, relaxed, calm and comfortable conditions, guided by the researcher, facial exercises are carried out for 5 minutes. Subjects were instructed to fast for one hour and not talk before saliva was retrieved. After one hour the researcher took saliva samples and collected them in a measuring cup by spitting saliva twice and recorded them. The collected saliva was then counted to determine the comparison of the amount of secretion before and after facial exercises.

This study was approved by the comitee of the research ethics of the faculty of dentistry, Baiturrahmah University in Padang with the approved number of 001/KEPK-FKGUNBRAH/19/12/2023

RESULTS

Table 1 Frequency Distribution Based on Respondent Gender

Gender	*f*	%
Male	11	13.9%
Female	68	86.1%
Total	79	100%

Table 1 illustrates that the gender of most respondents in this study was female as many as 68 people (86.1%), while male respondents were 11 people (13.9%).

Table 2 Frequency Distribution Based on Respondent's Age

Age (Years)	*f*	%
60 - 63	23	29.2%
64 - 66	25	31.6%
67 - 69	31	39.3%
Total	79	100%

Table 2 shows that respondents with the highest age in this study were 68 years old with 17 people, while respondents with the least age were 63 years old with 1 person.

Tabel 3 Mean Age of Respondents

	Mean (ml)	Standar Deviation (ml)	Minimum	Maximum
Age (year)	65,16	2,91	60	69

Table 3 shows that the average respondent is 65 years old. The respondent with the lowest age is 60 years old, the respondent with the highest age is 69 years old.

Univariate Analysis Results

Table 4 Frequency Distribution of Total Salivary Secretion Before and After Facial exercise

Salivary Secretion Volume	Min (ml)	Max (ml)	Mean	SD
Before Facial exercise	0,9	1,4	1,11	0,09
After Facial exercise	1,4	1,9	1,62	0,10

Table 4 shows that out of 79 respondents, the average amount of salivary secretion before doing facial exercises is 1.11 ml and after doing facial exercises the average amount of salivary secretion is 1.62 ml. From these data it can be seen that the change in the amount of salivary secretion before and after doing facial exercises

Bivariate Analysis Results

Table 5 Kolmogorof Smirnov Normality Test Results

Salivary Secretion Volume	*p Value*
Before Facial exercise	0.001
After Facial exercise	0.001

The results of the normality test in table 5 show that the p value before facial exercises is 0.001 and after facial exercises is 0.001, both of which show a p value <0.05, which means that the data is not normally distributed (p>0.05). Thus the analysis continued with the Wilcoxon Signed Ranks non-parametric test.

Table 6 Wilcoxon Signed Ranks Test Result.

Research Variable	Mean	*p Value*
Total salivary secretion before and after facial exercises	40	0.001

The results of the Wilcoxon Signed Ranks Test in table 6 above obtained a p value of 0.001 or probability <0.05, which means Ho is rejected and Ha is accepted, namely there is a very significant difference between the amount of salivary secretion before facial gymnastics and after facial gymnastics. The results of the analysis indicate the effect of facial gymnastics on the amount of salivary secretion in the elderly.

DISCUSSION

Measurement of the amount of salivary secretion showed a difference between the amount of salivary secretion before and after facial exercises. The difference is characterized by an increase in the amount of salivary secretion after facial gymnastics. The average amount

of salivary secretion before facial gymnastics 1.118 ml increased to 1.629 ml. The results of this study are in line with research conducted by Utami et al. (2023), where the average before facial exercises was 0.6 ml to 1.1 ml with a p value of 0.000 which shows that facial exercises have an impact on increasing the amount of salivary secretion.[14] Research conducted by Raj et al (2020) also shows an increase in the amount of salivary secretion after facial exercises with a p value of 0.000 in this study also shows that facial exercises have an impact on the amount of salivary secretion.[5]

This happens because the implementation of facial exercises gets mechanical stimulation, namely facial muscle exercises to stimulate the parotid glands with circular movements on the cheeks using the palms of the hands, tongue exercises by moving the tongue, stretching the lips, cheeks to stimulate the submandibular glands, massaging the salivary glands by pressing under the tongue to stimulate the sublingual glands. These movements cause mechanical stimulation of the salivary glands. Similar mechanical stimulation is performed when chewing, tasting, yawning, smiling and rubbing the cheeks.[15] These mechanical movements in the mouth stimulate receptors by the Nervus Trigeminalis (V) and Nervus Fasialis (V2), stimulating implus receptors on afferent nerve fibers that carry information to the salivary center in the spinal cord, blood flow, and parasympathetic activity.[8] Increased stimulation of parasympathetic activity can ultimately reduce salivary viscosity which makes saliva thinner and increases the flow of salivary secretions, which directly affects the increase in the amount of salivary secretion in the oral cavity.[8]

Saliva has a role in the occurrence of caries through mechanical cleaning which results in less plaque accumulation by reducing solubility through calcium, phosphate, and fluoride content in salivary buffers and neutralizing the acids of cariogenic organisms.[16] Dilute saliva will increase the self cleansing properties of saliva which helps saliva naturally clean food residue plaque, reducing the risk of caries and oral infections.[17] Regular facial exercises have a good effect, especially for the elderly. Facial exercises effective for increasing salivary secretion will certainly be very helpful in overcoming discomfort in the oral cavity, discomfort in the oral cavity occurs because in the elderly, there are atrophic changes in the salivary glands related to degeneration due to the aging process.[18] Deterioration of salivary gland function occurs due to loss of parenchymal glands which are replaced by connective tissue and fat.

This results in a reduction in the amount of salivary flow. Ageing also has an atrophic effect on the submandibular glands which also contributes to decreased production and changes in salivary composition.[19] Facial exercises increase the amount of salivary secretion can reduce difficulty speaking, swallowing food, improve oral function, such as a decrease in symptoms of dry mouth or xerostomia in the elderly, xerostomia results in an increase in the XeQoLS score which affects the decline in the quality of life of the elderly.[14] Increasing the

amount of salivary secretion also prevents bad breath, maintaining the balance of oral OH.[4] Facial exercises will affect the pH of saliva, the pH of saliva will become normal, the size of the mouth opening is normal, there is no halitosis, and oral motor skills improve, the jaw joints will also be trained and will eliminate stiffness in the jaw joints.[20]

Elderly people who do routine facial exercises will help in the process of tasting food due to increased salivary secretion so that the appetite in the elderly increases and nutrition in the elderly will be fulfilled. Adequate nutrition will increase the productivity of the elderly, productive elderly make other limbs actively move which makes the elderly body healthier and fitter.[14] The increasing health of the elderly is directly proportional to the increasing quality of life of the elderly, this will certainly increase the number of elderly welfare.[5]

CONCLUSION

Based on the data obtained from this study, it can be concluded that there is a significant difference between the amount of salivary secretion before facial gymnastics and the amount of salivary secretion after facial gymnastics. This shows that facial gymnastics has an effect on increasing the amount of salivary secretion in the elderly at the Mandiagin Health Center, Bukittinggi City.

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