

Application Of Breathing Exercises to Increase Lung Capacity and Oxygen Saturation in The Elderly at Putra Mandiri Foundation Gorontalo City

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ABSTRACT

With Increasing Age, There Is A Decrease In Physiological Functions In Organs, One Of Which Is The Respiratory Organ. According To (Pangestuti Et Al., 2015), That Breathing Exercises Using The Diaphragm Muscle Can Provide A Large Space For Lung Development So As To Increase The Strength Of The Respiratory Muscles. This Community Service Activity Aims To Implement Breathing Exercises As An Effort To Increase Oxygen Saturation (Sao₂) And Lung Capacity In The Elderly. The Targets Of This Community Service Are The Elderly Who Are At The Putra Mandiri Foundation, Gorontalo City. This Activity Is Carried Out In 3 Stages, Namely Simulation Of Breathing Exercises In The First And Second Stages, Monitoring And Evaluation In The Third Stage. The Results Of This Community Service Analysis Show A P Value (0.000) For An Increase In Sao₂ And A P Value (0.03) For An Increase In Lung Capacity. Based On The Results Of The Analysis, It Can Be Concluded That There Is An Effect Of The Application Of Breathing Exercises On The Sao₂ And Lung Capacity Of The Elderly. The Recommendation From This Community Service Is That Breathing Exercises Can Be Carried Out At The Posyandu For The Elderly At The Puskesmas And Become One Part Of Efforts To Prevent Lung Disease In The Elderly.

Keywords: Breathing Exercises, Oxygen Saturation, Lung Capacity

INTRODUCTION

The Increasing Life Expectancy Means The Higher The Number Of Elderly In Indonesia, This Is A Logical Consequence Of The Success Of Development In Indonesia Which Needs To Be Anticipated So That The Elderly Become Part Of A Productive, Independent Society And Do Not Become A Burden On Society. One Of The Positive Impacts Of Increasing Life Expectancy Is That The Elderly Are In A Healthy, Active And Productive State (Masnah & Kaimuddin, 2018). Based On Statistical Data That There Was An Increase In Life Expectancy In Indonesia From 2018 To 2019 Although It Was Not Significant, Based On Gender The Life Expectancy Rate For Men Increased From 69.3 To 69.4 And The Life Expectancy Of Women From 73.13 Increased To 73.33 (Badan Pusat Statistik, 2019).

Along With Increasing Age, Biological Processes Are Characterized By Progressive Changes Related To Susceptibility To Various Diseases, A Decrease In Physiological Functions In Organs, Including The Respiratory Organs. This Is Associated With A Decrease In Lung Structure And Function In The Elderly. Changes In The Anatomy Of The Respiratory System And Gas Exchange Processes With Age Are Almost Indistinguishable From Changes That Occur Due To Other Factors Such As Air Pollution, Smoking, Environmental Exposures And Lifestyle. From Research Results (Hasan & Maranatha, 2019), It Is Known That Respiratory Efficiency Decreases With Age. When The Aging Respiratory System Is Exposed To Other Factors Such As Pollution And Smoking, The Injury Is Cumulative And The Respiratory System Abnormalities Are More Pronounced And Severe.

The Risk Of Respiratory System Disorders In The Elderly, Apart From Being Affected By A Decrease In Lung Structure And Function, The Elderly Also Have To Face External Risk Factors Such As The Corona Virus Which Is Currently A Pandemic. The Elderly Are A Group That Is Very Vulnerable To Contracting Covid-19 Caused By Exposure To The Corona Virus, Because

Until Now The Highest Death Rate Due To COVID-19 Is The Elderly With A Percentage Of 11.24% Or 6,519 Cases (Kridhangkara, 2021).

The Respiratory System Is One Of The Vital Systems, Which Delivers Oxygen Into The Body, So An Effort Is Needed To Maintain The Stability Of The Respiratory System. Breathing Exercises Can Be An Easy And Inexpensive Option, But They Can Increase The Ability Of The Inspiratory Muscles, Thereby Increasing Lung Expansion. This Will Improve The Performance Of The Lungs To Enter More Oxygen (Putri Et Al., 2017).

In Addition To The Reasons Stated In The Paragraph Above, The Reason The Team Took The Theme Of Community Service Was To Apply The Results Of The Previous Team's Research On The Effect Of Personal Protective Equipment For N95 Masks And Hazmat Coveralls On Nurses Who Served In The 2020 Covid-19 Special Isolation Room, So That The Application Of Breathing Exercises Is Expected To Be A Solution When There Is A Decrease In Oxygen Saturation (Aswad & Loleh, 2021).

However, This Community Service Cannot Take The Subject Of Covid-19 Nurses, Because Of Restrictions On Interaction To Prevent Exposure To Covid-19, So That The Subject Of This Community Service, We Direct The Elderly As A Special Community With Risk Factors. The Objectives To Be Achieved From Making This Program Are As Follows:

1. There Is An Increase In Oxygen Saturation After Breathing Exercises Using Oximetry
2. There Is An Increase In Lung Capacity After Breathing Exercises Using Spirometry
3. There Is An Increase In The Ability Of The Elderly To Practice Breathing Exercises Regularly

METHOD

This Community Service Is Carried Out In Three Stages Of Implementation, Namely Simulation Of Breathing Exercises In The First And Second Stages, Monitoring And Evaluation In The Third Stage.

1. Stage I

Activities At This Stage Are Observing Oxygen Saturation and Lung Capacity Of The Elderly Before Being Given Deep Breathing Activities, Providing Education On The Importance Of Breathing Exercises And Simulating Breathing Exercises (Pursed Lip, Diaphragm, Lions Breath And Coherent)

2. Stage II

The Activity At This Stage Is To Evaluate Oxygen Saturation And Lung Capacity Before And After Breathing Exercises.

3. Stage III

This Stage Is The Implementation Of Monitoring And Evaluation Of The Problems Found In The Field, As Well As The Ability Of The Elderly To Carry Out Simulations Of Breathing Exercises Independently

RESULTS

This Community Service Provides Education On Breathing Exercises To The Elderly In Increasing Lung Capacity And Oxygen Saturation So That They Can Restore Lung Vitality And Prevent Various Types Of Lung Diseases. The Number Of Elderly People Involved As Participants In This Community Service Is 30 Elderly People Who Are Assisted By The Putra Mandiri Foundation. In The Following, We Can See The Characteristics Of The Participants And Changes In Lung Capacity And Oxygen Saturation Before And After Breathing Exercises

Table 1. Participant Characteristics

Age	Frequency	Percent (%)
Late Elderly	16	53.3
Elderly	14	46.7
Gender	Frequency	Percent (%)
Male	5	16.7
Female	25	83.3

Work	Frequency	Percent (%)
Housewife	22	73.3
Trader	2	6.7
Craftsman	2	6.7
Farmer	4	13.3

Based On The Data Above, The Number Of Participants In The Elderly Category Is 46.7%, Most Of Them Are Female Or 83.3%, And Most Of Them Work As Housewives By 73.3%.

Table 2. Lung Capacity

Lung Capacity	Frequency		Percent (%)	
	Pre	Post	Pre	Post
Sufficient	22	16	73.3	53.3
Good	8	11	26.6	36.6
Very Good	0	3	0	10
Total	30	30	100	100

Based On Table 4.2, Lung Capacity In The Good Category Increased From 26.6% To 36.6% And The Very Good Category Increased From 0% To 10%

Table 3. Oxygen Saturation

Oxygen Saturation	Increase Amount	Percent
Pre	22	73.3%
Post	26	86.6%

Data From Table 4.3 Oxygen Saturation Increased After Breathing Exercise From 73.3% To 86.6%

DISCUSSION

Based On The Data Obtained, It Can Be Concluded That There Is An Increase In Lung Capacity And Oxygen Saturation. And The Increasing Understanding Of The Elderly In Doing Breathing Exercises Is Characterized By The Ability Of The Elderly To Simulate Breathing Exercises.

This Is Supported By Research (Pangestuti Et Al., 2015) That Breathing Exercises Using The Diaphragm Muscle Can Provide A Large Space For Lung Expansion So That It Can Increase The Strength Of The Respiratory Muscles And Can Expel More Air (Expiration) And The Trapped Air In The Lungs Becomes Less. Reduced So That The Benefit Of Diaphragmatic Breathing Exercises Is To Increase The Efficiency Of Breathing. According To (Sarijo & Junadi, 2015), With Breathing Exercises, Participants Will Be Trained To Inhale A Lot Of Air And Exhale The Remnants Of Combustion, This Trains The Strength And Efficiency Of The Chest Cavity Muscles.

Breathing Exercises Are Carried Out To Improve Ventilation And Oxygenation, The Basic Techniques Used Are Deep Breathing Exercises, Pursed-Lip Breathing And Diaphragmatic Breathing (Potter & Perry, 2006). Deep Breathing Is One Of The Strategies To Reduce Pain As A Non-Pharmacological Nursing Intervention That Can Be Implemented, Deep Breathing Can Be Used To Reduce Pain Or Muscle Tension And Anxiety (Rahmayanti Et Al., 2017).

Based On The Lung Capacity Table And Partial Oxygen Saturation Table Among The Elderly, There Is No Increase In Either Lung Capacity Or Oxygen Saturation, This Is Related To The Age Factor That Causes A Decrease In Lung Function. The Results Of The Analysis Using The SPSS T Test, The Value Of P = 0.000 For Oxygen Saturation Means That There Is A Significant Difference In Oxygen Saturation Before And After Being Given Breathing Exercises, And P = 0.03 For Lung Capacity, Meaning That There Is An Effect Of The Application Of Breathing Exercises On Lung Capacity. However, If You Look At The Difference In The Mean Value Between The Pre And Post Tests, It Is Not Too Far Away. Some Of The Participants Did Not Experience Changes In Pre And Post Oxygen Saturation.

According To (Masnah & Kaimuddin, 2018) That In The Elderly There Will Be A Decrease In Airway Function This Will Cause An Increase In Airflow Resistance, Obstruction, Pulmonary Hyperinflation And Ventilation And Perfusion Imbalances. Clinical Manifestations Shown Are The Sensation Of Chest Tightness And Dyspnoe. In This Situation, It Will Result In An Increase In The Work Of The Respiratory Muscles, As A Form Of The Body's Mechanism To Maintain Pulmonary Ventilation. But Over Time The Respiratory Muscles Experience Weakness.

This Is Supported By The Results Of Research (Pribadi, 2015) Concluding, One Of The Factors That Affect Heart-Lung Endurance Is Age. Decreased Function Of Transport Organs Occurs Due To Increasing Age, Meaning That Age Will Affect The Ability Of The Circulatory System And Respiratory System To Adapt To The Effects Of All Physical Workloads.

CONCLUSIONS AND RECOMMENDATIONS

The Results Of This Community Service Analysis Show A P Value (0.000) For An Increase In Sao2 And A P Value (0.03) For An Increase In Lung Capacity. Based On The Results Of The Analysis, It Can Be Concluded That There Is An Effect Of The Application Of Breathing Exercises On The Sao2 And Lung Capacity Of The Elderly. The Recommendation From This Community Service Is That Breathing Exercises Can Be Carried Out At The Posyandu For The Elderly At The Puskesmas And Become One Part Of Efforts To Prevent Lung Disease In The Elderly.

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APPENDIX



Figure 1. Simulation



Figure 2. Education