

EFFECT OF PROGRESSIVE MUSCLE RELAXATION ON THE FUNCTIONAL STATUS OF THE ELDERLY IN THE INTEGRATED SERVICES UNIT OF THE ELDERLY BINJAI

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Abstract

The elderly are very vulnerable to overcome musculoskeletal disorders such as joint pain and back pain. The estimated health status of the elderly can be changed in their Functional Status, which will affect Physical, psychological, and spiritual. This study discusses progressive muscle relaxation training in the Functional status of the elderly in the Binjai Elderly Integrated Services Unit. The research method was conducted by pre-experiment with the design of one group pretest-posttest. The number of samples consisted of categories from 60 years to 82 years, collected 33 people. The implementation method is done with progressive relaxation exercises for 30 minutes in a seated position with 15 hand and foot movements with 33 elderly people repeatedly. Data collection tools in this study use demographic data questionnaires and Barthel index. Data analysis using Pearson correlation coefficient, where the value of sig. (2-tailed) $0.085 > 0.05$ which means there is no significant effect between progressive muscle relaxation exercises with the functional status of the elderly. The progressive muscle relaxation exercises only experience changes in vital signs so that it is very effective in a sitting or standing position.

Keywords: Elderly; Joint Pain; Back Pain; Progressive Muscle Relaxation; Movement

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1. Introduction

Elderly is someone who is aged sixty years and over. Aging elderly is an aging process that is influenced by several factors, namely improving nutrition, health services, education, and socioeconomic. The number of elderly people in Indonesia is estimated at 23.66 million people in 2017. Every 100 elderly people experience a 28.62 percent morbidity rate since 2015. Elderly who do not take care of their health will have an impact on their endurance of 26.04 percent (Kemenkes RI, 2017). Elderly undergoing physiological, physical and psychological changes. Physiological changes that often occur in the elderly tend to be in blood vessels, and musculoskeletal disorders. Changes that occur make the elderly often experience injuries or swelling due to collisions and are difficult to recover in a short time ("Skin Care and Aging," n.d.). Muscle changes in humans generally cause weakness and disability and changes in body composition such as insulin resistance, type 2 diabetes, hypertension, and hyperlipidemia which results in increased mortality. period of body pressure (Nair, 2005). Exercise, the

process of losing mass and skeletal muscle strength that causes functional capacity and an increased risk of chronic metabolic disease in the elderly (Nair, 2005). One way to overcome the problem of the elderly is progressive muscle relaxation exercises.

The elderly usually live in their own homes or in their children's homes, there are also elderly who choose to live in nursing homes. The elderly consider them as a burden to the family, so they prefer to live in nursing homes. they are permanent residents of nursing homes. Changes to enter the elderly often occur physically, mentally and socially. Unpreparedness of the elderly in dealing with aging tends to be a source of stress accumulation (Lestari, Pendidikan, Kedokteran, Kedokteran, & Diponegoro, 2013; McCabe, West, Veliz, & Boyd, 2017). The aging process that occurs in the elderly is considered as an important predictor of functional status that interferes with daily activities ("How to Reduce Tension With Progressive Muscle Relaxation," n.d.). Functional status assessment by looking at the ability of the elderly function in carrying out daily activities such as bathing, feeding, bladder, bowels, grooming,

transfer, dressing, and stairs. The items of functional status assessment are in 10 Barthel index instrument items (Liu, Unick, Galik, & Resnick, 2015).

Progressive muscle relaxation exercises are exercises with techniques to reduce body pressure from the lower limb to the upper limb (Shahriari, Dehghan, Pahlavanzadeh, & Hazini, 2017). This exercise is part of cognitive-behavioral therapy that aims to reduce psychological stress, improve sleep quality and disrupt the aging body ("How to Reduce Tension With Progressive Muscle Relaxation," n.d.). Relaxation exercises have a sustained effect on the elderly. Relaxation lowers blood pressure, heart rate, heart rate, cardiac dysrhythmias, reduces oxygen demand, and reduces muscle tension, metabolic rate, and improves fitness (Haryati & Sitorus, 2015). In study Haryati (2009) found that in 24 respondents did progressive muscle relaxation exercises on functional status in chemotherapy patients at Dr. Hospital. Wahidin Sudirohusodo Makassar with ($p = 0,000$) which means that progressive muscle relaxation exercises affect functional status (Prasetyo, 2016). The Elderly Integrated Social Services Unit is a government-run unit to accommodate the elderly who do not have a family or are abandoned by their families. The unit is located in the Binjai area precisely on Jalan Perintis Kemerdekaan, Binjai. Binjai is one of the cities in the province of North Sumatra, Indonesia. Binjai is located 22 km west of the capital city of North Sumatra province, Medan. Before the status of a municipality, Binjai was the capital of Langkat Regency which was later transferred to Stabat. The number of elderly people who lived at that time was around 197 people, thus representing the number of research samples to be studied. Based on this study, researchers conducted research related to progressive muscle relaxation that aims to determine the effectiveness of progressive muscle relaxation exercises in the functional status of the elderly in the integrated services unit for elderly people.

2. Method

The research method uses pre-experiments with the design of one group pretest-posttest. When the study was conducted in 28 days in April 2019 - May 2019. The implementation was carried out in the morning and evening with the inclusion criteria of the elderly, able to exercise, healthy conditions, and cooperative. The research sample of 33 elderly with purposive sampling technique. There are 2 instruments used in this study, namely demographic data and Barthel index questionnaire. Demographic data asks; age, gender, origin and ethnicity. Barthel index instrument is used to measure 10 elderly activities ranging from feeding, bathing, self-care, dressing, bowel, urinating, toilet use, moving, moving and going up / down stairs (Liu et al., 2015). Barthel index instrument measures the functional status of the elderly in performing daily activities by doing progressive muscle relaxation exercises before and

after treatment. Barthel reliability index has been identified from 12 studies including care related to the elderly that this instrument is recommended for measuring elderly with physical disorders but not recommended for cognitive impairments. The measurement category of the Barthel Index identifies 10 items of activities namely: feeding, bathing, caring, dressing, defecating, using the toilet, stairs, moving and others. With a score of 0 = not able, 5 = need help, and 10 = independent. This instrument is filled after progressive muscle relaxation is performed. To assess progressive muscle relaxation exercises as beneficial for the elderly, the researchers measured vital signs by looking at changes in blood pressure, pulse frequency, breathing frequency, and body temperature. These changes are recorded and observed whether there is a training effect. After the intervention was completed, the researchers conducted a statistical analysis using IBM SPSS (Statistical Package for Social Sciences) version 25.

3. Results and Discussion

The results of this study were carried out for the elderly who live in integrated elderly care centers at Binjai with an age range of 60 to 82 years. Demographic data can be seen from age, gender, origin, and ethnicity.

Demographic data based on age is the majority aged 65 years and 68 years as many as 6 (18.2 percent). Ages 65 and 68 years are the ages where the aging process occurs due to decreased body protein accumulation (Nair, 2005). The data obtained aged 60-82 years who lived in the tresna werdha binjai orphanage were 21 (63.6 percent). The majority of elderly people living in the fields are 17 (51.5 percent). The elderly who live in urban areas tend to be more receptive and independent in carrying out daily activities.

Table 1. Demographic in the Binjai Elderly Integrated Services Unit

Demographic Data	Frequency (N)	Percentage (%)
Age		
60 year	1	3.0
63 year	3	9.1
64 year	1	3.0
65 year	6	18.2
66 year	1	3.0
67 year	4	12.1
68 year	6	18.2
69 year	1	3.0
70 year	3	9.1
71 year	2	6.1
73 year	1	3.0
74 year	1	3.0
75 year	1	3.0
78 year	1	3.0
82 year	1	3.0

Gender	12	36.4
Male	21	63.6
Female		
Origin		
Pancur Batu	1	3.0
Pangkalan	2	6.1
Brandan	17	51.5
Medan	1	3.0
Yogya	2	6.1
Aceh	1	3.0
Tanjung Balai	1	3.0
Patumbak	5	15.2
Binjai	1	3.0
Kisaran	1	3.0
Dumai	1	3.0
Belawan		
Ethnicity		
Java	24	72.7
Aceh	2	6.1
Karo	2	6.1
Batak	3	9.1
Padang	2	6.1

Table 2. Functional status based on Barthel Index (N=33)

Functional Status	Score
1. Feeding	5
2. Bathing	0
3. Grooming	0
4. Dressing	0
5. Bowels	10
6. Bladder	10
7. Use toilet	0
8. Transfer	10
9. Moving	0
10. Stairs	5

From this Barthel index data the elderly who are in the Integrated Service Unit of the Elderly Binjai can do their daily activities independently and functional status in good condition

Table 3. Changes in the average vital signs of the elderly who do progressive muscle relaxation exercises with the observation method for 28 days on weeks 1 - 7.

Day	Vital sign	Pre-Test	Post-Test	Ratio
I	Blood pressure	6.89	5.79	1.2:1
	Pulse Frequency	5.05	6.23	0.8:1
	Breath Frequency	4.09	4.82	0.8:1
	Temperature	1.55	1.59	0.9:1
II	Blood pressure	5.89	6.26	0.9:1
	Pulse Frequency	4.52	6.36	0.7:1
	Breath Frequency	4.21	5.06	0.8:1
	Temperature	1.89	1.80	1:1
III	Blood pressure	5.98	6.44	0.9:1
	Pulse Frequency	5.06	5.97	0.8:1
	Breath Frequency	4.05	4.67	0.8:1
	Temperature	1.95	1.88	1:1

IV	Blood pressure	6.24	5.70	1:1
	Pulse Frequency	5.61	6.02	0.9:1
	Breath Frequency	4.48	4.56	0.9:1
	Temperature	1.62	1.77	0.9:1
V	Blood pressure	6.44	5.80	1:1
	Pulse Frequency	5.59	5.98	0.9:1
	Breath Frequency	4.38	4.53	0.9:1
	Temperature	1.50	1.77	0.8:1
VI	Blood pressure	5.74	6.14	0.9:1
	Pulse Frequency	5.29	6.18	0.8:1
	Breath Frequency	4.08	4.91	0.8:1
	Temperature	1.80	1.86	0.9:1
VII	Blood pressure	6.05	6.32	0.9:1
	Pulse Frequency	5.21	5.95	0.8:1
	Breath Frequency	4.08	4.62	0.8:1
	Temperature	1.91	1.86	1:1

From table 1, it can be concluded that there are changes in vital signs after progressive muscle relaxation exercises are performed in the elderly.

Table 4. Average changes in vital signs of progressive muscle relaxation (PMR) exercises on day 8 - day 14.

Day	Vital Sign	Pre-Test	Post-Test	Ratio
VIII	Blood pressure	6.33	5.76	1:1
	Pulse Frequency	5.55	6.02	0.9:1
	Breath Frequency	4.45	4.39	1:1
	Temperature	1.61	1.89	0.8:1
IX	Blood pressure	6.36	5.65	1:1
	Pulse Frequency	5.59	6.00	0.9:1
	Breath Frequency	4.48	4.38	1:1
	Temperature	1.64	1.89	0.8:1
X	Blood pressure	6.23	6.05	1:1
	Pulse Frequency	5.95	4.92	1.2:1
	Breath Frequency	4.79	4.58	1:1
	Temperature	1.58	1.91	0.8:1
XI	Blood pressure	5.79	6.09	0.9:1
	Pulse Frequency	5.30	6.20	0.8:1
	Breath Frequency	4.09	4.92	0.8:1
	Temperature	1.76	1.85	0.9:1
XII	Blood pressure	6.39	5.67	1.1:1
	Pulse Frequency	5.58	6.00	0.9:1
	Breath Frequency	4.41	4.42	0.9:1
	Temperature	1.64	1.89	0.8:1
XIII	Blood pressure	6.47	5.53	1.2:1
	Pulse Frequency	5.65	6.05	0.9:1
	Breath Frequency	4.42	4.59	0.9:1
	Temperature	1.53	1.76	0.8:1
XIV	Blood pressure	5.74	6.17	0.9:1
	Pulse Frequency	5.33	6.17	0.8:1
	Breath Frequency	4.06	4.97	0.8:1
	Temperature	1.82	1.74	1:1

From table 4, it appears that in the second week (days 8 to 14) the pulse rate, breathing frequency and body temperature increased during PMR exercise for 30 minutes. When blood pressure decreases on days 8 to 10. Eleventh to fourteenth

days experience an increase and reduce pain experienced by the elderly.

Table 5. Average changes in vital signs of progressive muscle relaxation (PMR) exercises on days 15 - 21 days.

Day	Vital sign	Pre-Test	Post-Test	Ratio Score
XV	Blood pressure	6.44	5.42	1.2:1
	Pulse Frequency	5.48	5.30	1.0:1
	Breath Frequency	4.32	5.79	0.7:1
	Temperature	1.52	1.73	0.8:1
XVI	Blood pressure	6.00	5.91	1.0:1
	Pulse Frequency	5.35	6.15	0.8:1
	Breath Frequency	4.12	4.89	0.8:1
XVII	Blood pressure	1.82	1.76	1.0:1
	Pulse Frequency	6.05	6.30	0.9:1
	Breath Frequency	5.20	5.98	0.8:1
XVIII	Blood pressure	4.05	4.58	0.8:1
	Pulse Frequency	1.94	1.91	1.0:1
	Breath Frequency	6.14	5.61	1.1:1
XIX	Blood pressure	5.47	5.85	0.9:1
	Pulse Frequency	5.27	4.23	1.2:1
	Breath Frequency	1.65	1.79	0.9:1
XX	Blood pressure	6.44	5.76	1.1:1
	Pulse Frequency	5.61	6.02	0.9:1
	Breath Frequency	4.38	4.53	0.9:1
XXI	Blood pressure	1.50	1.77	0.8:1
	Pulse Frequency	5.79	6.18	0.9:1
	Breath Frequency	5.29	6.18	0.8:1
XXII	Blood pressure	4.09	4.97	0.8:1
	Pulse Frequency	1.73	1.77	0.9:1
	Breath Frequency	5.94	6.32	0.9:1
XXIII	Blood pressure	5.20	6.00	0.8:1
	Pulse Frequency	4.02	4.59	0.8:1
	Breath Frequency	2.14	1.80	1.2:1
XXIV	Blood pressure	2.14	1.80	1.2:1
	Pulse Frequency	2.14	1.80	1.2:1
	Breath Frequency	2.14	1.80	1.2:1
XXV	Blood pressure	2.14	1.80	1.2:1
	Pulse Frequency	2.14	1.80	1.2:1
	Breath Frequency	2.14	1.80	1.2:1
XXVI	Blood pressure	2.14	1.80	1.2:1
	Pulse Frequency	2.14	1.80	1.2:1
	Breath Frequency	2.14	1.80	1.2:1
XXVII	Blood pressure	2.14	1.80	1.2:1
	Pulse Frequency	2.14	1.80	1.2:1
	Breath Frequency	2.14	1.80	1.2:1
XXVIII	Blood pressure	2.14	1.80	1.2:1
	Pulse Frequency	2.14	1.80	1.2:1
	Breath Frequency	2.14	1.80	1.2:1

Table 5 shows the changes in blood pressure on days 15 and 19 where there is a decrease in blood pressure that occurs in the elderly. The elderly experience an increase in pulse frequency, breathing and body temperature in the elderly. Conditions experienced by the elderly can change at any time depending on the conditions experienced by the elderly. Study Belguith, et al. (2017) found that during the fasting period more potential to decrease kidney function and increase glycemia so that it affects the vital signs of the elderly themselves.

Table 6, the average changes in vital signs (blood pressure, pulse frequency, breathing frequency, and body temperature) at the fourth week (days 22-28) where changes every week depend on the health condition of the elderly.

From the above table 7, it can be concluded that the value of Sig. (2-tailed) between Progressive Muscle Relaxation Exercise with functional status is $0.085 > 0.05$, which means there is no significant correlation between the Progressive Muscle Relaxation Exercise variable and functional status

Table 6. Average changes in vital signs of progressive muscle relaxation (PMR) exercises on day 22 - day 28.

Hari	Vital sign	Pre-Test	Post-Test	Ratio Score
XXII	Blood pressure	6.36	5.83	1.0:1
	Pulse Frequency	5.58	6.11	0.9:1
	Breath Frequency	3.74	4.74	0.7:1
	Temperature	1.70	1.94	0.8:1
XXIII	Blood pressure	6.35	5.88	1.1:1
	Pulse Frequency	5.70	6.09	0.9:1
	Breath Frequency	3.70	4.73	0.7:1
XXIV	Blood pressure	1.74	1.82	0.9:1
	Pulse Frequency	6.44	5.79	1.1:1
	Breath Frequency	5.62	5.98	0.9:1
XXV	Blood pressure	4.38	4.52	0.9:1
	Pulse Frequency	1.50	1.77	0.8:1
	Breath Frequency	5.77	6.15	0.9:1
XXVI	Blood pressure	5.41	6.20	0.8:1
	Pulse Frequency	4.15	4.74	0.8:1
	Breath Frequency	1.83	1.74	1.0:1
XXVII	Blood pressure	6.33	5.73	1.1:1
	Pulse Frequency	5.85	5.91	0.9:1
	Breath Frequency	4.41	4.32	1.0:1
XXVIII	Blood pressure	1.62	1.83	0.8:1
	Pulse Frequency	6.47	5.89	1.1:1
	Breath Frequency	5.35	6.03	0.8:1
XXIX	Blood pressure	4.44	4.58	0.9:1
	Pulse Frequency	1.48	1.76	0.8:1
	Breath Frequency	5.80	6.06	0.9:1
XXX	Blood pressure	5.42	6.12	0.8:1
	Pulse Frequency	4.00	4.83	0.8:1
	Breath Frequency	1.95	1.80	1.0:1

Table 7. Effects of Progressive Muscle Relaxation (PMR) exercises on the Functional Status of the Elderly (N=33)

Progressive Muscle Relaxation Exercise	Pearson Correlation	Functional Status
Progressive Muscle Relaxation Exercise	1	.305
Functional Status	.305	1
	Sig. (2-tailed)	.085
	N	33

From the above table 7, it can be concluded that the value of Sig. (2-tailed) between Progressive Muscle Relaxation Exercise with functional status is $0.085 > 0.05$, which means there is no significant correlation

between the Progressive Muscle Relaxation Exercise variable and functional status.

This study has differences from previous studies because this study knows the effectiveness of progressive muscle relaxation in the functional status of the elderly in the Integrated Services Unit of the Elderly Binjai. The place that is the subject of the study is a place for parents to live independently and without family, relatives and blood relations. Elderly people tend to experience their own worries when entering old age, which is synonymous with readiness to accept changes in aspects of life (Indriana, Desiningrum, & Kristiana, 2011). The elderly will experience physiological and psychosocial changes that will affect the functional status of the elderly (Annisa & Ifdil, 2016). In this study the elderly will be given progressive training which was first carried out by Jacobson in 1934 by straining and releasing 16 muscle movements. Evidence that progressive muscle relaxation can be done is a response from tension and the body in doing relaxation techniques that can reduce headaches, insomnia, joint pain and irritation syndrome (McCallie, Blum, & Hood, 2006). Progressive Muscle Relaxation is done with full attention which is a management technique stress that can reduce negative thoughts worries (Feldman, Greeson, & Senville, 2010).

The results of the study (Kumutha V, Aruna, Poongodi R, & Professor, n.d.) states that the age of 60-70 years who do progressive muscle relaxation for 20 minutes for 21 days will increase during the transition and blood pressure. Prospective study conducted by (Arena, Hightower, & Chong, 1988) on 10 elderly with muscle relaxation for 8 weeks with posttreatment for 3 months proves a significant improvement in head care suffered. If in several studies stated that progressive muscle relaxation can reduce and provide a relaxing effect. In the study (Peck, 1998) found that 82 parents did relaxation therapy for 4 weeks at intervals of 1 week of treatment by walking and bending the legs. This treatment proves increased functionality in elderly people who suffer joint damage. Research conducted by (Ikemata & Momose, 2017) found a group of interventions that showed lower apathy and irritability after progressive muscle relaxation. An intervention conducted by (Adam, Ramli, & Shahar, 2016) found that relaxation therapy in improving functional balance and upper levels in the elderly increased by more than 80 years by 44 years by improving the Mini Mental State which replaced the significant. The effects of progressive muscle relaxation in pulmonary patients did not make changes but this therapy was able to reduce anxiety and depression for his illness (Lolak, Connors, Sheridan, & Wise, 2008). (Baird & Sands, 2004) found that the effectiveness of progressive muscle relaxation in osteoarthritis could reduce pain and difficulty in do activities. Study conducted by (Rausch, Gramling, & Auerbach, 2006) found that progressive muscle relaxation training by providing stress induction for 1 minute and 10 minutes of

treatment therapy found a decrease in anxiety in respondents.

4. Conclusions

Exercise Progressive muscle relaxation does not affect the functional status of the elderly. because progressive muscle relaxation exercises are performed in healthy elderly people and these relaxation exercises provide changes in vital signs (breath frequency, pulse frequency, body temperature and blood pressure). These changes help the elderly in improving their health.

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