

PHYSIOTHERAPY MANAGEMENT TO PREVENT COVID-19 BY IMPROVED PHYSICAL ACTIVITY IN ELDERLY

Andung Maheswara Rakasiwi¹

Ade Irma Nahdliyyah²

^{1,2} Pekalongan University, Health Faculty, Diploma 3 physiotherapy, Indonesia

*e-mail: maheswaraandung@gmail.com, adeirmanahdliyyah@gmail.com

*Correspondence: maheswaraandung@gmail.com

Submitted: 20th December 2022 *Revised:* 10th January 2023 *Accepted:* 17th January 2023

Abstract: Coronavirus 2019 (Covid 19) is an acute respiratory syn-drome caused by the corona-2 virus (SARS-CoV-2). Meanwhile, elderly is a condition characterized by a decline in the tissue's self-repairing func-tion. This decline causes various diseases and health problems, hence, efforts are needed to improve their physical condition and health after retirement. Therefore, this study aims to reduce the impact of Covid-19 on the elderly as well as to provide an overview of the physical problems associated with the virus and its prevention measures. This is an experimental study with a pre-experimental research design in the form of a one-group pre-post-test design. The results showed a probability with a p-value of <0.05, which indicates that physiotherapy management in the elderly during Covid-19 increased their physical activity, thereby eliminating the risk of exposure to the virus. The statistical analysis results showed that there was a sig-nificant difference between the pre-test and post-test on physiotherapy management. Furthermore, physical activity had a p-value of 0.015, which indicates that the level of physical activities carried out did not change, but it served as a motivation. The fear of contracting the virus had a p-value of 0.007, which shows that information on physical activity provided by physiotherapists had no effect on their fea.

Keywords: Covid-19; Elderly Physical Activity; PASE Scale.

INTRODUCTION

Coronavirus was identified from several cases in Wuhan City, China, and in mid-March, it was declared a pandemic by WHO after infecting more than 150,000 people and causing more than 5,000 deaths in 123 countries around the world. Consequently, all healthcare workers including physiotherapists / physical therapists have an important role in managing the effects of the virus. This study gathers relevant information that can help rehabilitation professionals to understand the virus and related diseases as well as their role in management and prevention. The disease is caused by the Severe Acute Respiratory Syndrome Corona-2 Virus (SARS-CoV-2), a single-stranded ribonucleic acid (RNA) encapsulated coronavirus. It is majorly transmitted through relatively large particles deposited in the air as well as direct contact with a patient. At present, there is still no specific antiviral treatment for the infection, apart from supportive therapy, such as respiratory care for affected patients, especially in more severe cases.

Approximately 15% of people with COVID-19 also develop moderate to severe diseases, and they often require hospitalization and oxygen support. Furthermore, 5% of the cases require admission to the Intensive Care Unit as well as supportive therapies, such as intubation and ventilation. The most common complication in severe cases of the infection is acute pneumonia, while others include acute respiratory disorder syndrome (ARDS), sepsis, and septic shock.

Meanwhile, multiple organ failures, such as acute kidney and cardiac injuries are more prevalent among the older age group > 70 years as well as patients with co-morbid health problems, such as cardiovascular disease, diabetes, lung disease, and immunosuppression.²

In the elderly, the disease is characterized by respiratory muscle atrophy, decreased long recoil elasticity, increased size, pulmonary compliance as well as tracheal and central airway stiffness. They can also experience enlargement of the alveolar duct, which causes an increase in the transmural pressure gradient during inspiration. Furthermore, the pressure gradient helps to produce normal lung expansion, improve gas exchange, and prevent disruption of the oxygen delivery process in the network.³ The state of being elderly is not a disease but an advanced stage of life process that is characterized by a decrease in the body's ability to adapt to environmental stress. Generally, signs of aging begin to appear from the age of 45 years, while health challenges start arising around the age of 60 years. This process is often accompanied by a decrease in life quality which leads to several health problems. One of the challenges associated with the condition is imbalance, which causes falling.

MATERIALS AND METHODS

This study aims to determine the effectiveness of physiotherapy management on the prevention of COVID-19 in the elderly. Furthermore, this is an

experimental study with a pre-experimental design in the form of a one-group pretest-posttest design, which compares the physical activity level before and after treatment. The sample population contains a total of 23 elderly people aged between 50-70 years.

Study Design:

This is an experimental study that uses a pre-experimental design in the form of a one-group pretest-posttest design

Study Location

This study was conducted in the elderly community.

RESULTS AND DISCUSSION

The table below shows the samples' age and gender.

Table 1. Number of Elderly Responden

Gender	Fre- quency	Percent	Valid Percent	Cumulative Percent
Valid	1	4.2	4.2	4.2
Male	14	58.3	58.3	62.5
Female	9	37.5	37.5	100.0
Total	24	100.0	100.0	

From the table, 23 elderly people were used as the research subjects, with a total of 14 males and 9 females.

Table 2. Physical activity relationship between the elderly before and after the intervention

	Premanagementp hysiotherapy	Post Management physiotherapy	Physical activity before management physiotherapy	Physical activity after management physiotherapy	Before getting information, fear of contracting the corona virus	Before getting information, fear of contracting the corona virus
Chi-Square	5.261 ^a	15.217 ^b	15.217 ^b	8.435 ^b	12.565 ^a	7.348 ^a
Df	1	2	2	2	1	1
Asymp. Sig.	.022	.000	.000	.015	.000	.007

Based on the table above with chi-square, the physiotherapy management probability for Covid-19 had a p-value of 0.000, p-value <0.05, which indicates that

there was a significant difference between the pre-test and post-test. Meanwhile, the elderly physical activity had a p-value of 0.015, which shows that the level of physical

activities carried out during the pandemic did not change but it can serve as a motivation. The information on the fear of contracting the virus had a p-value of 0.007, which indicates that the information on physical activity provided by the physiotherapists did not change their fear of being exposed to Covid-19.

Discussion

Physiotherapy management in the elderly

The cardiovascular activity of every physical activity is good, but the better its intensity and quantity, the greater the health benefits. Furthermore, regular physical activity is associated with a reduced risk of several diseases, including cancers and dementia. Patients with long-term disease conditions can benefit substantially from physical activity, which helps to prevent and manage several chronic conditions and diseases. The British Geriatrics Society has established its protective function in older adults, and they also stated that protecting parents from Covid-19 must not compromise their health and well-being. Staying indoors more often has a negative effect on old people as they are more likely to become deconditioned, and lose their muscle strength due to a lack of activity. Similarly, increased inactivity among self-isolating elderly leads to an increased risk of falling and related injuries. Low levels of physical activity also cause reduced strength, which leads to loss of independence and the need for future care. Consequently, the Public Health UK, Sheffield Hallam University (SHU), the National Center for Sport and Exercise Medicine (NCSEM), and Sport UK have developed an 'Active at Home'

booklet to provide practical guidance on home-based activities that can help to maintain their strength and balance. The Public Health England NFPCG also provided expert advice on preventing falls, fractures and promoting healthy aging. In response to Covid-19, NFPCG members have supported the development of several new resources to address the current issues surrounding falls and fractures (Akira & Takeda, 2004; Gleeson, 2007; Nieman & Wentz, 2019).

Coronavirus has infected many people around the world, and in Indonesia, more than 80,000 people have tested positive for the disease. Strengthening the body's immune system is a way of preventing the spread of the virus, and it can also protect the body from other diseases (Gleeson, 2007). Meanwhile, pre-Covid-19 data shows that there have been various efforts across the UK to keep the nation active, even among inequalities such as women, adults above 55 years, disabled as well as people with long-term conditions. A recent Sport England survey showed that 2 out of 3 (62%) adults confirmed the importance of being active and a similar proportion namely 69% and 65% believe that it helps to maintain their physical and mental health respectively. The survey also showed that physical activity levels had decreased, where 31% of adults did more activity, but 41% did less with 30%-38% in children. Therefore, efforts are needed to maintain the medical advancement achieved in the last ten years as well as to manage and recover from the effects of the pandemic. The survey showed that adults need to minimize the time spent on motion, and all citizens also need to

abstain from long-term inactivity.(Nieman & Wentz, 2019; ShahAli et al., 2020; Thomas et al., 2020) Strengthening and balancing activities are an important part of maintaining a healthy body for all age groups. Furthermore, they help to build healthy bones during childhood, maintain strength in adulthood, and prevent the decline in muscle mass and bone density during old age. There are a variety of ways to participate in these activities, such as lifting heavy objects, taking yoga or pilates classes, playing ball games, or badminton. However, some of these activities are more difficult to maintain indoors, but there are resources and guidance that can be followed.(Akira & Takeda, 2004; Gleeson, 2007; Nieman & Wentz, 2019).

The novel coronavirus 2019 (2019-nCoV) causes respiratory system disorders, acute pneumonia or lung infection as well as kidney failure, and WHO officially named it Covid-19 (Coronavirus disease 2019). At present, there is no vaccine for the disease (Pudjiastuti & Utomo, 2003; SANTOSO et al., 2014; Thomas et al., 2020; Utomo & Takarini, 2009)¹⁰, consequently, the Indonesian Ministry of Health has urged all citizens to always live a hygienic life and maintain their immune system. The human body has an immune system that fights disease-causing viruses and bacteria, but various factors impair their function, such as aging, malnutrition, diseases, and some drugs. Therefore, this function needs to be maintained to increase the effectiveness of the system. The consumption of foods rich in antioxidants, such as vegetables and fruit help the body to fight free radicals and maintain the immune system. Increased level of free radicals in the body leads to a

decrease in the immune system function, which increases the risk of Covid-19 infection. It is also advisable to increase the consumption of lean meats, nuts, and seeds because they enhance the body's immunity. Subsequently, onions and ginger can be consumed because they help the body fight against infection and reduce inflammation. (Gleeson, 2007; Morey et al., 2015).

Regular exercise increases the body's endurance and reduces the risk of inflammation, hence, it is important to exercise the body for at least 30 minutes every day. It is also important to manage stress because it increases the production of cortisol, thereby decreasing the body's immunity. Furthermore, stress can be controlled with various activities including getting enough sleep every day, hanging out with friends, sightseeing, meditation, and engaging in fun-filled activities. Rest is very essential as the lack of sleep has a negative effect on health, such as a decrease in body resistance against diseases. Moreover, several studies have showed that adults need approximately 7–8 hours of sleep every day, while children need 10 hours or more (Özkeskin et al., 2020; ShahAli et al., 2020; Thomas et al., 2020).

Physiotherapy management is a highly recommended therapy for the elderly because it strengthens their immune system and reduces the spread of Covid-19 to the lungs. Furthermore, it involves performing various physical activities which helps to improve the body's fitness and help with breathing.

Some of the recommended activities include:

1. Exercise at leisure: Activities that make the body inactive, such as watching TV and reading need to be avoided because they decrease the body's fitness.
2. Outdoor activities: Outdoor activities, such as walking, light exercise, and stretching can be carried out to improve physical fitness, but attention needs to be paid to Covid-19 protocols.
3. Engaging in recreational sports: This can be performed by combining sports activities with recreation, such as playing light games, jogging, swimming, and cycling. Furthermore, they can be carried out with children or family because it provides physical and cognitive relaxation, which help to activate the immune system and facilitate the production of more hormones.
4. Moderate exercise: This includes sports activities such as tennis, badminton, and other activities that require good energy and physical strength. Family members can accompany the elderly while carrying out the activities and attention needs to be paid to their abilities.
5. Muscle strength training: These exercises increase muscle strength and the type of activity carried out depends on individual's capability. For example, lifting a barbell with a weight of 1/2 kg, push-ups in certain positions increases the arms' strength as well as the body's endurance.
6. Household activities involves the movement of many joints, and they enhance the fitness of muscles, ligaments, joints as well as respiratory and cardiovascular organs. Furthermore, performing more functional activities maintains the movement/motion range of joints and prevents hypokinetic diseases (lack of movement).
7. Elderly gym activities can be carried out together with the community. Gymnastics requires guides and instructors to increase its effectiveness as well as to prevent injuries. Moving the joints or body to a certain degree helps the elderly stay fit and healthy.
8. Breathing exercises that can improve the body's fitness need to be carried out along with physical exercises to maintain the respiratory function of patients with long-term respiratory distress.(Fletcher et al., 2001; Goveas & Shear, 2020; Parmar & Modh, 2013)

CONCLUSIONS

This study aims to determine the effectiveness of physiotherapy management carried out for the elderly during the Covid-19 pandemic as well as to assess the physical activities that improved fitness levels and their effect on the body's immunity. The physical activities carried out before the intervention was limited to daily work activities at home, while sport activities that can improve the body's fitness were rarely performed due to a tight

work schedule. There-fore, physiotherapy management is needed to support or monitor the level of activity carried out. Family members, medical personnels, and the community also need to support elderly people with declining physical and functional conditions to improve their physical fitness. These efforts increases their immunity and reduces the risk of exposure to Covid-19 caused inactivity during the pandemic.

REFERENCES

- Akira, S., & Takeda, K. (2004). Effect of Escherichia coli infection of the bovine uterus from the whole animal to the cell*. *Nature Reviews Immunology*, 4, 499–511.
- Fletcher, G. F., Balady, G. J., Amsterdam, E. A., Chaitman, B., Eckel, R., Fleg, J., Froelicher, V. F., Leon, A. S., Piña, I. L., Rodney, R., Simons-Morton, D. A., Williams, M. A., & Bazzarre, T. (2001). Exercise standards for testing and training: A statement for healthcare professionals from the American Heart Association. In *Circulation* (Vol. 104, Issue 14, pp. 1694–1740). <https://doi.org/10.1161/hc3901.095960>.
- Gleeson, M. (2007). Immune function in sport and exercise. *Journal of Applied Physiology*, 103(2), 693–699.
- Goveas, J. S., & Shear, M. K. (2020). Grief and the COVID-19 Pandemic in Older Adults. *The American Journal of Geriatric Psychiatry*.
- Morey, J. N., Boggero, I. A., Scott, A. B., & Segerstrom, S. C. (2015). Current directions in stress and human immune function. *Current Opinion in Psychology*, 5, 13–17.
- Nieman, D. C., & Wentz, L. M. (2019). The compelling link between physical activity and the body's defense system. *Journal of Sport and Health Science*, 8(3), 201–217.
- Özkeskin, M., Elibol, N., & Bakırhan, S. (2020). Risk of COVID-19 Disease in the Elderly Population and Physiotherapy. *Physiotherapy*.
- Parmar, D., & Modh, N. (2013). Study of Physical Fitness Index Using Modified Harvard Step Test in Relation with Gender in Physiotherapy Students. In *International Journal of Science and Research* (Vol. 4).
- Pudjiastuti, S. S., & Utomo, B. (2003). *Fisioterapi pada lansia*. Jakarta: EGC.
- SANTOSO, P. R. I. H., Isnaini Herawati, Ss., & Wahyuni, Ss. (2014). *Efek Akut Deep Breathing Exercise Terhadap Nilai Saturasi Oksigen Pada Lansia*. Universitas Muhammadiyah Surakarta.
- ShahAli, S., ShahAli, S., Takamjani, I. E., & Shahabi, S. (2020). COVID-19 and Iranian older people: rehabilitation perspective. *European Journal of Physiotherapy*, 1–2.

Thomas, P., Baldwin, C., Bissett, B., Boden, I., Gosselink, R., Granger, C. L., Hodgson, C., Jones, A. Y. M., Kho, M. E., & Moses, R. (2020). Physiotherapy management for COVID-19 in the acute hospital setting: Recommendations to guide clinical practice. *Pneumon, 33*(1).

Utomo, B., & Takarini, N. (2009). Uji validitas kriteria Time up and go test (TUG) sebagai alat ukur keseimbangan pada lansia. *Jurnal Fisioterapi, 9*(2), 86–93.



© 2021 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY SA) license (<https://creativecommons.org/licenses/by-sa/4.0/>).
