

Physical Exercise for Older People with Hypertension in COVID-19 Pandemic: A Review of The Literature

Ni Luh Putu Dian Yunita Sari^{1*}, I Kadek Prastikanala², Fransiska Novita Sari³

^{1,2}Bachelor of Nursing, Stikes Bina Usada Bali, Indonesia; dian.yunita@binausadabali.ac.id (Corresponding Author)

³Bachelor of Nursing, Stikes Dirgahayu Samarinda, Indonesia

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ABSTRACT

The older people with hypertension are one of the populations that have a susceptibility to COVID-19. Physical exercise activities are postponed, so the older people must adapt to this situation. This literature review aims to review the physical exercise conditions of the older people with hypertension during the COVID-19 pandemic. The method used is a literature review by analyzing several relevant articles to answer the purpose of study. The online databases used are Science Direct, ProQuest, and PubMed from 2019 to 2022. The keywords used to sort articles in this study are: (1) older people, (2) physical exercise, (3) hypertension, and (4) COVID-19. The results are there were ten selected articles that analyzed, and three main themes found, namely (1) the types of physical exercise for the older people with hypertension during the COVID-19 pandemic, (2) the benefits of physical exercise for the older people with hypertension during the COVID-19 pandemic, and (3) the methods of carrying out physical exercise for the older people with hypertension during the COVID-19 pandemic. These results can be used as a basis for providing nursing care during to control blood pressure and quality of life of the older people with hypertension.

Keywords: aged; COVID-19; hypertension; physical exercise

INTRODUCTION

Older people with hypertension are one of the vulnerable groups to experiencing morbidity due to COVID-19. Data recapitulation obtained from World Health Organization on April 24, 2022, shows that more than 500 million confirmed cases and more than six million deaths have been reported globally. Southeast Asia reached 753,380 cumulative deaths as of 18-24 April 2022 and most of them occurred in the older people (WHO, 2022). The Indonesian Task Force for the Acceleration of COVID-19 in March 2020 reported that of the 25 confirmed positive cases, 24 cases were experienced by the older people group. Hypertension is the highest comorbid disease in patients with COVID-19 (Kemenkes RI, 2020). Data from one of the national central hospitals in Indonesia found that 14% of the older people with COVID-19 had comorbid hypertension (Azwar et al., 2020). This phenomenon shows that the older people group are the highest aggregate who experiencing COVID-19 with hypertension as the main comorbid.

COVID-19 patients with hypertension comorbid have increased expression of Angiotensin-Converting Enzyme 2 (ACE2). The virus enters the host cell through the ACE2 receptor and inhibits the formation of angiotensin. This condition causes homeostatic disturbances in the vascular system, causing vasoconstriction of blood vessels and increasing blood pressure (Muhamad et al., 2021). Another factor that supports the increase in age causes a decrease in the body's immune function. Hypertension in the older people is also a chronic disease that causes systemic inflammation so that it indirectly also affects the decrease in body immunity (Damayanthi, Prabani, & Weerasekara, 2021). This is in accordance with the fact that the age factor and chronic systemic inflammation further aggravate the condition of the older people who experience COVID 19. Based on this, hypertension in the older people needs to be overcome to minimize complications that occur.

Complications that can occur if the blood pressure of the older people with hypertension is not treated during a pandemic are complications in the heart such as acute myocardial injury, lethal arrhythmias, and multiple organ damage. The lower the immunity, the more complications that occur and the higher the risk of death (Moccia et al., 2020). This condition can be minimized by adopting a healthy lifestyle, one of which is regular physical exercise.

The proportion of physical exercise before COVID-19 in the 60-64 year group was included in the category of lacking in physical exercise, which was 31,4% and >65 years was 47,9% (Kementerian Kesehatan RI, 2019). In this condition, the older people can still do physical exercise inside or outside the home in groups in the "Posyandu Lansia". One previous study found that during the COVID-19 pandemic, older people with hypertension experienced a decrease in physical exercise and an increase in sedentary behavior. The limitations of physical exercise are related to the existence of a social distancing policy so that the older people spend more time at home (Browne et al., 2020).

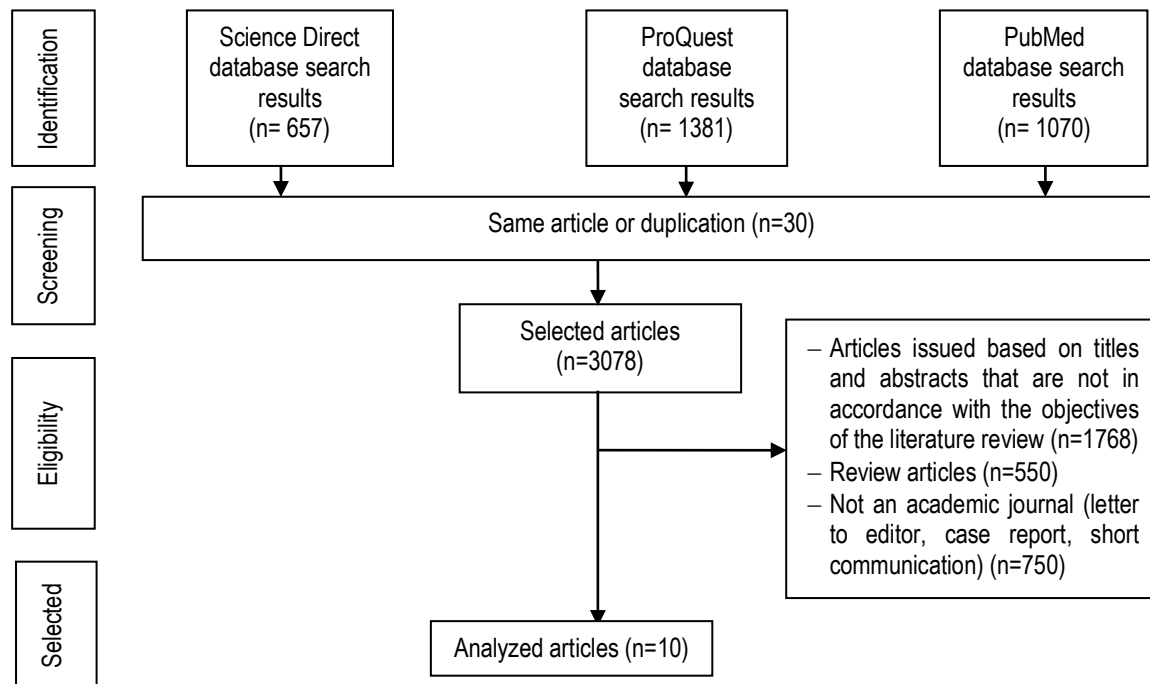
The policies of various countries to carry out social distancing help break the chain of transmission of COVID 19, but on the one hand it has an impact on a healthy lifestyle, namely the limitations of physical exercise (Jiao, Supriya, Chow, Baker, & Gao, 2022). Older people who are able to communicate with family or neighbors may be able to get information about ways to maintain their health status such as exercise and eating arrangements. On the other hand, the older people who do not get health information for themselves are at high risk of experiencing unhealthy lifestyle changes (Yamada et al., 2021). In addition, Adisiwi et al. (2021) mentioned that older people' quality of life mostly in moderate level (97,9%) during COVID-19 pandemic. This study suggested the older people must conduct regular physical activity.

Lack of physical exercise in addition to causing physical problems, can cause psychological problems. The limitations of shared activities outside the home cause the older people to become stressed, afraid of being infected with COVID-19, bored and confused about modifying the activities they do. Prolonged stress causes the older people to choose to reduce physical exercise at home because they feel they have no choice to do physical exercise (Jiménez-Pavón & Carbonell-Baeza, 2020). Previous researchers found that physical exercise done by the older people in quarantine at home can help reduce levels of anxiety and depression. Regular physical exercise is important to improve body immunity and mental health as a promotive effort to prevent the transmission of COVID-19 (Callow, Arnold-Nedimala, et al., 2020).

This phenomenon is the main urgency for conducting a literature review. It has attracted the attention of the authors to examine the physical exercises that can be done by the older people with hypertension during the pandemic. This can later be used as a basis for providing advice for the older people to do therapeutic physical exercise independently at home during the pandemic. The purpose of this study is to review the literature about the condition of physical exercise in hypertensive older people during COVID-19 pandemic.

METHOD

Literature review is the method chosen in this study. This study is analyzed by selecting some literature that is relevant to the purpose of study in order to obtain new conclusions. The online databases used are Science Direct, ProQuest, and PubMed from 2019 to 2022. This year is used because the COVID-19 has only occurred from 2019 until now. The keywords used to sort articles in this study are: (1) older people, (2) physical exercise, (3) hypertension, and (4) COVID-19. There are ten articles selected after the cut off the duplication articles. Scheme 1 describes the flow of article selection in three databases.



Scheme 1. Article Selection Flow

RESULT

The following are the results of the analysis of the ten articles selected in this literature review. There are three main themes found in this literature review, namely (1) the types of physical exercise for the older people with hypertension during the COVID-19 pandemic, (2) the benefits of physical exercise for the older people with hypertension during the COVID-19 pandemic, and (3) the methods of carrying out physical exercise for the older people with hypertension during the COVID-19 pandemic.

Table 1. Detailed Description of Selected Articles in The Study

No	Author/ Year	Title	Journal	Aim	Method	Result
1	Callow <i>et al.</i> (2020)	The mental health benefits of physical activity in older adults survive the COVID-19 pandemic	Am J Geriatr Psychiatry	To determine the relationship between the amount and intensity of physical activity of older people and depression and anxiety symptoms while COVID-19 pandemic.	Descriptive cross-sectional	Respondents who performed greater levels of physical activity experienced lower levels of depression symptoms but no relationship between physical activity and anxiety symptoms was found. The model of regression analysis showed that greater light and strenuous activity, but not moderate, predicted lower depression symptoms.
2	Ejiri, Kawai, Kera, Ihara, and Fujiwara (2021)	Exercise as a coping strategy and its impact on the psychological well-being of Japanese community-dwelling older adults during the COVID-19 pandemic: A longitudinal study	Psychology of Sport & Exercise	To determine the prevalence of exercise as a coping strategy among community-dwelling older people and its impact on psychological well-being during the COVID-19 pandemic.	Cross-sectional	Exercise as a coping behavior during the stay-at-home of the pandemic was associated with psychological well-being, with different impacts observed depending on the activity type. Older people who walked to maintain their physical and mental health experienced better well-being than those who did not.
3	Albermany and Al-lami (2021)	The effects of an online guided exercise programme in decreasing symptoms of mild depression and high blood pressure in a group of elderly males during the COVID-19 pandemic	Annals of the Romanian Society for Cell Biology	To determine efficacy of online guided exercise for treatment of older people mild depression and blood pressure.	An experimental study	The online guided exercise program can decrease symptoms of mild depression and blood pressure in older people males during the COVID-19 pandemic.
4	Buckinx <i>et al.</i> (2021)	Feasibility and acceptability of remote physical exercise programs to prevent mobility loss in pre-disabled older adults during isolation periods such as the COVID-19 pandemic	The Journal of Nutrition, Health & Aging	To determine the feasibility and acceptability of remote exercise to prevent mobility loss among older people.	An experimental study	Remote exercise using a web technology and booklet during lockdown was feasible and acceptable among older people.

No	Author/ Year	Title	Journal	Aim	Method	Result
5	Ibrahim et al. (2021)	Virtual group exercises and psychological status among community-dwelling older adults during the COVID-19 pandemic—A feasibility study	Geriatrics	To evaluate recruitment rates, data collection, and group exercises conducted through virtual technology older people.	A quasi-experimental study	The results presented in this study are that physical exercise in virtual form is very relevant to be carried out in developing countries, although the obstacle is internet accessibility.
6	Beauchamp et al., (2021)	Online-delivered group and personal exercise programs to support low active older adults' mental health during the COVID-19 pandemic: Randomized controlled trial	Journal of Medical Internet Research	To assess whether a group-based exercise program relative to a personal exercise program (both delivered online) and waitlist control (WLC) can improve the psychological health of low active older people during the COVID-19 pandemic.	Randomized controlled trial	Participants in the group condition displayed improved mental health relative to WLC participants over the first 10 weeks. and although the week 12 effect (ES=0.375) was in the same direction the difference was not statistically significant (P=.089). Participants in the personal condition displayed improved mental health, when compared with WLC participants, in the same medium ES range. In addition, participants in the group condition displayed improvements in physical health when compared with the WLC (ES=0.079-0.496) across all 12 weeks of the study following baseline.
7	Levinger et al. (2020)	Exercise intervention outdoor project in the community for older people – results from the ENJOY Seniors Exercise Park project translation research in the community	BMC Geriatrics	To evaluate the effect of physical activity through the senior exercise park physical activity program for older people	A quasi-experimental study	The results is the seniors exercise park can be an effective modality for improving older people's physical function and wellbeing and can be an important public health infrastructure investment for older people.
8	Goethals et al. (2020)	Impact of home quarantine on physical activity among older adults living at home during the COVID-19 pandemic: Qualitative interview study	JMIR Aging	To evaluate the impact of quarantine period on physical activity programs, physical and mental health of older people and to discuss alternatives that could be suggested.	A qualitative study	This study suggests that the COVID-19 pandemic has affected physical activity programs of older people. Older people expressed the need to perform physical activity at home.

No	Author/ Year	Title	Journal	Aim	Method	Result
9	Murukesu, Kaur, Singh, Shahr, and Subramani-am (2021)	Physical activity patterns, psychosocial well-being, and coping strategies among older persons with cognitive frailty of the "WE-RISE" trial throughout the COVID-19 movement control order	Clinical Interventions in Aging	To compare psychological wellbeing, physical activity patterns, and coping strategies of older people by the "WE-RISE" throughout this COVID-19 pandemic.	A quasi-experimental study	Respondents of the intervention group were more physically active, functionally independent and had higher self-perceived social-psychological wellbeing regarding living a meaningful life and feeling respected.
10	Rodrigues et al., (2021)	The MoveStrong program for promoting balance and functional strength training and adequate protein intake in pre-frail older adults: A pilot randomized controlled trial	PLoS ONE	To assess the feasibility of implementing a model (MoveStrong) of service delivery to teach older people about balance and functional strength training and methods to increase protein intake.	Randomized controlled trial	Respondents reported several benefits from the exercise program including improved posture, strength, balance, self-esteem/confidence, and enhanced social interactions with other participants in the program. Most respondents found the nutrition sessions helpful and were not aware that they lacked protein in their diets.

DISCUSSION

The Types of Physical Exercise for The Older People with Hypertension During The COVID-19 Pandemic

The results of this study state that there are several types of physical exercise that are relevant for the older people during the pandemic. Online guided exercise program such as walking, aerobics, and slow running, and relaxation exercise with soft music can decrease symptoms of mild depression and high blood pressure in a group of males older people during the COVID-19 Pandemic (Albermany & Al-lami, 2021). Another study stated that remote physical exercise programs such weight-bearing strengthening, standing balance, light aerobic exercises, and stretching can prevent mobility loss in pre-disabled older adults during COVID-19 pandemic (Buckinx et al., 2021). These two studies states that there are several exercises that can be done by the older people during the pandemic, namely aerobics, balance exercises, and relaxation.

Some of the results of the research above are in line with the review of Ghram et al. (2021) which stated that some relevant exercises to do at home were aerobics, balance exercise, mind-body exercise, game-based and some exercises that used technology. In addition, one of the interesting types of home-based exercise for the older people is exergame. Exergame has been applied by Corregidor-Sánchez et al. (2021) with the results that exergames can be part of the rehabilitative treatment of the functional impairment of older people affected by COVID-19. Exergame is short for "exercise" and "game". So, this intervention utilizes virtual games to stimulate the older people in doing physical activities.

Several types of physical exercise in this literature review are possible to do in Indonesia. Anuar et al. (2021) mentioned that there are several types of physical exercise that are relevant for the older people in Indonesia, such as elderly exercise, aerobics, walking exercise, pilates, static bicycles, jogging, and treadmills. Besides that, Ajinar and Is (2021) said that the exercise that the older people did most often during the pandemic was walking in the morning. It was also mentioned by Fatmawati et al. (2021) namely walking while basking in the sun at 09.00 am can increase the body's immune and increase vitamin D in the skin. In addition, Helen, Evilianti, and Juita (2021) stated that active range of motion exercise significantly effective to increase upper extremity muscle strength (p value 0,001) and lower extremity muscle strength (p value 0,002) in older people with hypertension and diabetes mellitus. Abdillah, Istiqomah, Kurnianto, and Khovifah (2022) also mentioned that the effective duration and frequency of range of motion are 10-30

minutes/session and 2 session/day. So, hypertensive older people are strongly advised to do physical exercise independently during this pandemic based on some of the options that have been mentioned above.



Figure 1. Home-Based Exercise (Ghram et al., 2021)

The Benefits of Physical Exercise for The Older People with Hypertension During The COVID-19 Pandemic

There are several benefits of doing physical exercise identified in this literature review, namely physical, psychological and social benefits. Maio et al. (2022) stated that the combination of balance and muscle-strengthening training has proven to be particularly useful in limiting falls and mobility limitations of older people. In addition, Goethals et al. (2020) mentioned that physical exercise affect the level of independence and physically active. Regular physical exercise can help activate Nuclear Respiratory Factor 2 (Nrf2) in the myocardium and various damaged tissues (Moccia et al., 2020). Hypertensive older people experience chronic systemic inflammation so it is necessary to do regular physical exercise to stimulate the work of Nrf2 to repair damaged tissue.

In addition to physical benefits, physical exercise is also useful in improving the mental health of the older people. This is in line with some of the results of this literature review as mentioned by Callow et al. (2020) that physical exercise alleviate some of the negative mental health impacts such as depression and anxiety. Moreover, Ejiri, Kawai, Kera, Ihara, and Fujiwara (2021) mentioned that physical exercise can be a coping strategy during the stay-at-home period was associated with psychological well-being for older people. Physical exercise in dance is also beneficial for the psychological health of the older people during the pandemic. Aliberti and Raiola (2021) mentioned that "Line Dancing" improved older people's state of depression. Older people felt a better satisfaction in their life, a greater interest in activities, less boredom, had a good mood most of the time, greater happiness throughout the day, and the perception of a wonderful life.

Nuraini et al., 2021) stated that social interaction among older people during COVID-19 pandemic significantly changed (p-value 0,045). It means that there was a significant change in older people' social interaction during. Another benefit obtained from physical exercise is in the social interaction aspect. Murukesu, Kaur, Singh, Shahar, and Subramani-am (2021) mentioned that older people who did regular physical exercise had higher self-percieved social prosperity regarding living a meaningful life and feeling respected. These results are in line with the main result of Daniel, Anwar, Fajar, Sitorus, and Ghiffari (2021) study which states that there is an increase in the quality of life in the social domain (p value 0,001) in the older people who get a virtual physical exercise program. So, comprehensively physical exercise can affect the quality of life of the hypertensive older people during the pandemic, especially in the physical, psychological, and social domains.

The Methods of Carrying Out Physical Exercise for Older People with Hypertension During The COVID-19 Pandemic

The methods used in carrying out physical exercise for the elderly during the pandemic are mostly by utilizing simple technology and media. Ibrahim et al. (2021) stated that all participants were invited to take part in a four-week course of daily virtual group exercises (take part in a 30-min daily). Exercise adherence was recorded using a daily exercise diary. In addition, Rodrigues et al., (2021) generated The MoveStrong exercise program that gave workbooks that include pictures and instructions of each exercise so the participants could practice and exercise at home or at another location. It did twice a week for 8-weeks. Moreover, Beauchamp et al., (2021) developed The Seniors COVID-19 Pandemic and Exercise (SCOPE) by utilizing the "Canvas" platform which allows access to exercise programs and intervention materials. Communication and monitoring are carried out with the media zoom meeting.

Some of the results of the analysis of articles used in this literature review are in line with previous studies that utilized technology in providing physical exercise interventions. Zulaika et al. (2021) mentioned that the virtual physical exercise (VPE) program was used to provide interventions to improve mental status during the COVID-19 pandemic. Besides that, Piech and Czernicki (2021) mentioned that virtual reality games are very relevant to be used for the older people during the pandemic. So, the use of ideal technology is applied during a pandemic to optimize physical exercise for the older people with hypertension.

The condition of the older people in Indonesia cannot fully access technology. So, this requires solutions and strategies to utilize technology in doing physical exercise at home. The role of cadres and caregivers for the older people is very much needed in the use of this technology. Nurses can suggest that cadres or families help access relevant physical exercise media so that the older people can do it at home during the COVID-19 pandemic.

CONCLUSION

This literature review resulted in three main themes, namely (1) the types of physical exercise for the older people with hypertension during the COVID-19 pandemic, (2) the benefits of physical exercise for the older people with hypertension during the COVID-19 pandemic, (3) the methods of carrying out physical exercise for older people with hypertension during the COVID-19 pandemic. These results can be used as a basis for providing nursing care during to control blood pressure and quality of life of the older people with hypertension. These results can be used as a basis for creating educational media and relevant methods during the pandemic.

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