Jurnal Sains Sukan dan Pendidikan Jasmani Vol 11, No 1, 2022 (24-28)
ISSN: 2232-1918 / eISSN: 2600-9323
https://ejournal.upsi.edu.my/journal/JSSPJ

Exercise as A Non-Pharmacological Approach in Managing Hypertension in Malaysia: A Narrative Review

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Published online: 16 Februari 2022

To cite this article (APA): Mohd Mujar, N. M., Ismail, M. M., & Kamaruddin, H. K. (2022). Exercise as A Non-Pharmacological Approach in Managing Hypertension in Malaysia: A Narrative Review. *Jurnal Sains Sukan & Pendidikan Jasmani, 11*(1), 24-28. https://doi.org/10.37134/jsspj.vol11.1.3.2022

To link to this article: https://doi.org/10.37134/jsspj.vol11.1.3.2022

ABSTRACT

The management of high blood pressure has included both pharmaceutical and non-pharmacological approaches. Despite the fact that anti-hypertensive medications efficiently lower blood pressure, the expense of health care is growing and is likely to continue to rise in the future. This article review emphasizes the usefulness of exercise modalities as an essential non-pharmacological tool and acceptable preventive measures that can be used to the treatment of hypertension in Malaysia.

Keywords: Physical activity, Exercise, Hypertension, High blood pressure, Prevention

INTRODUCTION

Hypertension is a major risk factor for cardiovascular diseases (CVD), which is Malaysia's leading cause of death (Institute for Public Health, 2019). The risk of myocardial infarction, heart failure, stroke, and kidney disease could be increased by a rise in blood pressure. The risk may increase if other comorbidities such as dyslipidemia, diabetes mellitus, or smokers are present in a hypertensive person.

A non-pharmacological approach to controlling high blood pressure has been implemented in the clinical practice guidelines for hypertension control (Ministry of Health Malaysia, 2018). In coping with hypertension in the Malaysian community, seven holistic non-pharmacological therapies have been suggested. By following a healthier diet (e.g. reduction of high-saturated and trans-fat diets, more fruit and vegetable consumption), reduced salt intake, reduced alcohol intake, weight loss, stopping smoking, relaxation therapy, and increased physical activity, hypertension treatment is advised through reducing the modifiable risk factors for hypertension by healthy living. To minimize complications and the cost of long-term health care for hypertensive patients and early prevention steps for high-risk individuals, behavioral improvements are necessary. One of the finest examples of physical activity and good balanced lifestyles is exercise. It is also recommended for all people with hypertension and for those at high risk.

Several studies have shown important effects in hypertensive individuals of exercise therapy and blood pressure control (Cornelissen & Smart, 2013; Sosner et al., 2017). A survey carried out in Perak, Malaysia found a strong correlation between physical activity and hypertension (Loh et al., 2013). Those with a moderate or lower physical activity level were 1.40 times more at risk of

developing hypertension than those who were physically active (95% CI: 1.04-1.78). Similarly, a study of Malay adults showed a significant association between metabolic syndrome and hypertension, irrespective of the intensity of physical activity (Chu & Moy, 2014). The efficacy, protection, and suitability of this clinical population group, however, are still scarce. In Malaysia, there is a lack of systematic research to examine the physiological relationship between the level of physical activity and hypertension in the current population, including those who are not diagnosed with hypertension. Based on the evidence available from published literature to adapt appropriately to Malaysia, this paper will examine and address the utility of exercise modalities as a non-pharmacological approach to managing hypertension.

Exercise Modalities for Hypertension

Randomized controlled trials (RCTs) on the relationship of aerobic exercise modality and hypertension were investigated in a narrative analysis by Börjesson et al. (Borjesson et al., 2016). Detailed protocols on frequency, intensity, length, and type of exercise (e.g. walking, jogging, cycling and swimming) have been established by 21 of the 27 studies. With high-quality proof of level 3+, by high-intensity, moderate-intensity, or both workouts, there were a 10.8/4.7 mmHg reduction in blood pressure in hypertensive individuals. The training duration varies from 40 to 60 minutes per session, three or more days a week, indicating that hypertension relief has been shown to have a substantial impact. Walking is a common form of exercise, and walking 30 minutes or 3 km a day contributes to a significant reduction in blood pressure (Borjesson et al., 2016; Moreau et al., 2001).

A systematic analysis by Dassanayake et al. (2020) also observed the effects of aerobic exercise therapy. In contrast to the non-exercise group, the exercise group of those who experienced endurance or aerobic activity reported a statistically significant decrease in blood pressure. After physical activity and exercise, a mean decreases in blood pressure of 12.6 mmHg systolic blood pressure (SBP) (95% CI: 15.17 - 9.34) and 6.12 mmHg diastolic blood pressure (DBP) (95% CI: 7.76 - 4.48) was observed (Chu & Moy, 2014). A further recent study of hypertensive subjects also recorded a decrease in outpatient blood pressure with a mean difference of SBP 4.06 mm Hg [95% CI: 5.19 - 2.93] and DBP 2.7 mmHg [95% CI: 3.58 - 1.97]) by aerobic exercise (Sosner et al., 2017). The emphasis given to aerobic exercise, supplemented with moderate intensity resistance training, is emphasized by the American College of Sports Medicine (ACSM). The proof for it, however, is unsure and even debatable (ACSM, 2018; Borjesson et al., 2016). There is still a shortage of studies on the effects of different types of training on the clinical population of people living with hypertension in Malaysia, generally in Asia and developing countries.

It also researched the relationship between resistance training and hypertension. No substantial decrease in blood pressure was observed in the study of 148 hypertensive patients who performed different dynamic resistance exercises, such as circuit training or combined with aerobic exercise (Borjesson et al., 2016). In the meantime, there was a reduction in systolic and diastolic blood pressure following resistance training in another study (Dassanayake et al., 2020), but the decrease in blood pressure was not as significant as aerobic exercise.

A substantial decrease in blood pressure among hypertensive and non-hypertensive classes, regardless of medication status, has also been shown by isometric resistance exercise training. Exercise training isometric resistance regimen consisting of 4 sets of hand or foot contractions performed continuously for 2 minutes with an interval of 1 to 4 minutes, between maximal voluntary contractions of 20 to 50 percent, showing a mean reduction gap between systolic 10 to 13 mmHg and diastolic 6 to 8 mmHg. This isometric resistance exercise training frequency is suggested to be completed 3 to 5 days a week for optimum benefit within 4 to 10 weeks (Millar et al., 2014).

The same goes for training with isometric handgrip (IHG) and bilateral isometric training. There was a decrease in blood pressure with a mean value of 9.8/1.8 mmHg (2+ levels of evidence) when IHG was applied, using a maximum contraction strength of 30 percent for 2 minutes, every 4 sets performed 3 times a week (Borjesson et al., 2016). It is suspected that restoring muscle blood flow by acute metaboreflex stimulation and enhancing vascular endothelial function and modulating improvements in baroreflex sensitivity and long-term autonomic control (Dassanayake et al., 2020; Millar et al., 2014) is the probable mechanism that supports the gain of isometric exercise.

A combination of aerobic and resistant exercise also demonstrated a substantial decrease of 9.2 mmHg (95% CI: 12.0 to 8.2) in systolic blood pressure and 7.7 mmHg (95% CI: 14.0 to 8.3) in diastolic blood pressure (Dassanayake et al., 2020). Therefore, a combination of all forms of exercise, namely aerobic exercise combined with dynamic resistant training and isometric exercise appears to be an ideal program of training for hypertensive patients that may be suitable for the Malaysian population.

Underlying Mechanisms for Improvement of Hypertension

Through several mechanisms, regular exercise can lower blood pressure. At an early stage of hypertension, the effects of physical activity can be more important. High blood pressure is mainly due to a rise in cardiac output, where the vessels affected are less adapted and remodeled (Dassanayake et al., 2020). A combination of changes in endothelial function, arterial compliance, sympathetic activity, and heart rate adaptability is thought to be the result of the reduction in blood pressure associated with resistance training (Dassanayake et al., 2020). Exercises can also minimize the influence of sympathetic over excitation and increase the vagal tone, thereby decreasing peripheral systemic resistance (Borjesson et al., 2016; Millar et al., 2014; Sosner et al., 2017).

Cardiovascular pathology, such as left ventricular hypertrophy (Borjesson et al., 2016), may also be likely for athletes with hypertension. In this case, before undertaking strenuous physical exercise or professional sports, athletes should undergo clinical examination and laboratory testing to determine the risks. In all sports, athletes with low added risk and no target organ damage can compete with well-controlled blood pressure (Borjesson et al., 2016).

The exercise training in hypertensive patients described by the American College of Sports Medicine (ACSM) (ACSM, 2018) is linked to several precautions. The prescription of the exercise should be performed correctly with incremental improvement, explicitly to adjust the speed. Before beginning exercise to determine exercise heart rate, an inflated blood pressure response to relatively low-intensity exercise can warrant an exercise test. A rating of perceived exertion (RPE) scale may be used if the peak exercise heart rate is an issue. Maintaining systolic blood pressure at or below 220 mmHg and diastolic blood pressure at or below 105 mmHg during exercise is also important. When engaged in an exercise such as weight lifting, stop breath-holding, resulting in exaggerated blood pressure reactions such as dizziness and fainting. Patients should be made aware of immediate hypotension after exercise and encouraged to modulate the impact, such as walking slower to minimize intensity (ACSM, 2018).

Innovative exercises for Malaysian clinical population

Hypertension treatment exercises should be adjusted according to the particular stage of hypertension and the resources of the individual. A hybrid mode of exercise is optimally successful as described above and can work well for patients at home in a time-efficient manner. Similar results are provided by several tutorials and visual-based exercise styles, such as circuit training, aerobic dance, Tabata, and HIIT.

Many businesses have started implementing and offering leisure and fitness services in the workplace over the last few years. A research conducted in Putrajaya, involving Malaysian government employees (Huei Phing et al., 2017) with metabolic syndrome randomly allocated by cluster to a prompt point-of-decision group, an aerobics group, and a control group based on the formula for sample size calculation. For all participants, step counts were measured by Lifecorder e-STEP accelerometers. According to the harmonizing concept, metabolic syndrome was established. Individuals with at least three of the five metabolic risk factors would be identified as having metabolic syndrome (e.g. waist circumference, high-density lipoprotein cholesterol, triglycerides, fasting glucose levels, systolic and diastolic blood pressure). The findings showed that there is a disparity between the intervention and control groups in phase counts. In the aerobics community, the most important decline in the proportion of people with metabolic syndrome was observed, with a 79.4 percent decrease in the post-intervention evaluation relative to the baseline assessment. In addition, Tenaga Nasional Berhad, a Malaysian electricity utility provider, launched a Total Wellness Programme (Tenaga Nasional Berhad, 2020). All workers can devote an hour of their weekly working hours to engage in physical activity in the workplace through this corporate responsibility initiative.

While this initiative does not concentrate on people with high blood pressure, it is a pilot programme that will facilitate a healthier lifestyle and foster an active working atmosphere that promotes the well-being of all employees.

Workplace prevention services for hypertension among workers are practical and should be taken as an initial step to resolve metabolic syndrome. For most organizations, irrespective of public or private bodies, it is a corporate social duty to assist workers and the public in a healthy lifestyle and facilitate sustainable health and well-being.

CONCLUSION

Physical activities through multiple exercises can effectively reduce blood pressure in managing hypertension. Precautions should be taken before exercise prescription to prevent adverse outcomes. The best training modality for hypertension is not fixed since training prescriptions should be careful, creative, and innovative according to the needs, resources, and interests of the client. Intervention program such as exercise class and wellness program is useful in promoting a healthy lifestyle. Sustainable well-being is ideal starting from the workplace as it has high peer support and facilities. Exercise is not only beneficial for early treatment and prevention but also a suitable non-pharmacological approach that can be adapted in managing hypertension in Malaysia.

ACKNOWLEDGEMENT

The authors would like to thank Universiti Sains Malaysia (USM) for permission to publish this paper. This paper was not funded by any grant.

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