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Review Article

Study Analysis of Brisk Walking Exercise Effects on Cardio-Respiratory Fitness Among Middle Age Adult People: Literature Review

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Abstract

Background: Non-Communicable Disease (NCD) are diseases that cannot be transmitted from one individual to another. In other words, the disease does not harm other people. The community belongs to one main NCD group with the same risk factor (common underlying risk factor). Non-communicable diseases can be prevented by avoiding risk factors and achieving a good level of fitness. One way to improve fitness is by doing brisk walking.

Objectives: The purpose of this study was to determine the effect of brisk walking on cardio-respiratory fitness in the middle adult age group.

Methods: In the strategy to find the journal framework used is PICOT. The data sources used were taken from the e-resources database of the National Library of Indonesia, Pubmed, and Google Scholar, then selected using the PRISMA flow diagram to produce nine articles. Each article has been described and criticized in the form of a matrix table using a simplified approach method.

Results: The results of the study found that brisk walking had a significant effect on cardio-respiratory fitness in the middle adult age group.

Conclusion: This exercise can also be recommended for anyone who wants to live a healthy life and is recommended to be done at home with the implementation according to the recommendations. The ineffectiveness of brisk walking can also be influenced by several factors so before doing this exercise, the indications and contraindications should be considered.

Keywords: brisk walking, fitness, cardio-respiration, middle adult

Introduction

Non-Communicable Disease (NCD) is increasingly becoming a health burden for most of the population today. NCD is the leading cause of death at the global level. This causes NCD to become one of the main challenges of the Sustainable Development Goals (SDGs). At this time, it is estimated that there will be a rapid increase in the incidence of non-communicable diseases. It is estimated by WHO that in 2020 non-communicable diseases will be the cause of 73% of deaths and 60% of all morbidity in the world. Some of the common diseases in NCD are cardiovascular disease, diabetes mellitus, cancer, and chronic respiratory disease.¹ Changes in disease patterns from infectious diseases to non-communicable diseases occur because of epidemiological changes that are in line with demographic changes in Indonesia which also cause changes in socio-economic, environmental, and population structures, namely people adopt unhealthy lifestyles, such as smoking, and eating food. high cholesterol, alcohol consumption, and lack of exercise. This unhealthy lifestyle causes physical incompetence in each individual, so the risk of experiencing NCD is even greater.²

Physical fitness is closely related to a person's state of health. Health is defined as a state of physical, mental, and social well-being and not disease or weakness, so it can be concluded that an indicator of a person being said to be healthy is having good physical fitness. Fitness is the ability to carry out daily activities without feeling excessive fatigue. Therefore, physical fitness is needed to complete daily activities well, because, with good fitness, daily tasks or activities can be carried out properly without feeling excessive fatigue. Fatigue occurs as a result of not having enough oxygen to provide energy. The fulfillment of oxygen into the body to provide energy in carrying out activities is influenced by the level of cardiorespiratory endurance.³ Cardiorespiratory endurance is very important to support muscle work by taking oxygen and distributing all active muscle tissue so that it can be used for metabolism. Cardiorespiratory endurance is closely related to VO₂Max so someone who has a good VO₂ will use oxygen more optimally so that cardiorespiratory endurance will be better and will affect a person's physical fitness. One way to achieve a good degree of fitness (cardiorespiratory endurance) is by doing physical exercise or sports. Regular exercise can reduce or eliminate cholesterol deposits found in blood vessels. This can happen if the exercise that is done moves all the joints and muscles of the body. In addition to sports, physical exercise can also increase the degree of excellent fitness.³

Physical exercise can be in the form of aerobic and anaerobic exercises. Aerobic exercise is an exercise that requires oxygen for energy formation and is carried out continuously by involving large muscles, especially leg muscles. This exercise is usually done with a low-moderate intensity that can be done periodically over a long period. While anaerobic exercise is a high-intensity exercise that requires fast energy in a short time but is not done regularly for a long duration.³ One of the recommended aerobic exercises to increase cardiorespiratory endurance is brisk walking. This exercise has no skills, facilities, or equipment requirements, and is more accessible and acceptable than other forms of physical activity training.⁴ Brisk walking is an activity of walking or brisk walking that is carried out continuously, for a minimum of 30 minutes every day. For cardiac exercises, the calculation of the training zone is 60% - 80% of the maximum pulse rate. Maximum pulse rate figures are taken from 220 – to age. Brisk walking is moving forward with footsteps done in such a way that one foot is always in contact with the ground. The leg that is traveling must be straightened at least for a moment if it is in a vertical position.⁵ The success of this brisk walk has been proven by several studies conducted such as Agustina's research (2017) which shows that there is an effect of brisk walking exercise on increasing fitness.⁶ This is also in line with research conducted by Kurniawan (2013) which showed that brisk walking exercise affected the fitness of the control group or those who were given the brisk walking treatment.⁷

According to Nuanda (2013), a decrease in physical fitness can occur in various age groups and genders.³ A survey conducted in the United States on 8,500 adults aged 20-49

years found that 13.9% of adults have low fitness levels. This is also in line with research conducted by Firmansyah & Noortje (2017) which shows that the level of physical fitness in the adult group is mostly less (47.37%). According to the data, the researcher concludes that brisk walking exercises could be one alternative to light exercise that can help improve the physical fitness of adults in carrying out daily activities, because when a person does not exercise for only 2 weeks, muscle performance will decrease, and at the age of 50 years, physiological abilities will also decrease.⁸ The purpose of this study is to analyze the updates of the specific research on brisk walking exercises, for us as a researcher to go further with intervention research design, for Indonesian population.

Methods

This research uses the literature review method. The strategy for finding journals uses the PICOT (Population, Intervention, Comparison, Outcome, Time) framework. The keywords used are brisk walking exercise AND cardio-respiratory AND middle age adult people. The data sources used are the e-resources database of the National Library, Pubmed, and Google Scholar in the form of articles or journals. The inclusion criteria in this study were national and international journals with a deadline for publication of articles within the last 7 years, with quantitative, qualitative, and systematic review research methods. Researchers used the PRISMA Flow Diagram Protocol in screening articles that matched the inclusion criteria. The search flow aims to select so that relevant articles are obtained. Furthermore, to analyze the article, the author uses the critical appraisal method developed by Aveyard (2010) which explains that the analysis process must be structured to determine the strengths and limitations of a study, as well as determine its relevance to the research objectives. The author chose The Joanna Briggs Institute (JBI) critical appraisal tool.

Results

In the search for articles using three databases, nine complete manuscript articles were found that met the inclusion criteria. The total of the initial searches of the three databases can be seen in the Chart. 1 is the PRISMA flowchart that shows the article screening process in this study. The nine articles used research from Huang et al. (2019)¹⁰, Chan et al. (2018)¹¹, Bernard et al. (2018)¹², Sun et al. (2018)¹³, Blain et al. (2017)¹⁴, Chen et al. (2016)¹⁵, Abdullah et al. (2016)¹⁶, Gaba et al. (2016)¹⁷, and Wu et al. (2015)¹⁸. The nine articles obtained were all in English, and all of them used a Randomized Controlled Trial (RCT) design with a fairly diverse sample use. Each article has been described and criticized in the form of a matrix table using a simplified approach method. The author determines the code from the research results obtained, then the codes are grouped into conclusions.

Based on Table. 1 it can be seen that in nine articles, five articles were found showing the results that brisk walking provided several good benefits for several types of respondents, namely respondents who did brisk walking experienced less fatigue than respondents who did not, provided benefits for improving balance ability, and increasing endurance. walking on respondents who are physically deconditioned, reduces several cardiovascular risk factors in respondents who are overweight and obese, and effectively manages blood pressure. In addition to brisk walking providing several benefits, 3 articles explain that brisk walking exercises are less beneficial, such as not providing changes in cardiovascular disease risk indicators, having less effect on respondents with postural kinematics, and having less effect on fatigue levels of industrial employee respondents. Another thing that can be found is that 1 article explains that the effectiveness of brisk walking is influenced by body weight, fat mass, and visceral adipose tissue.

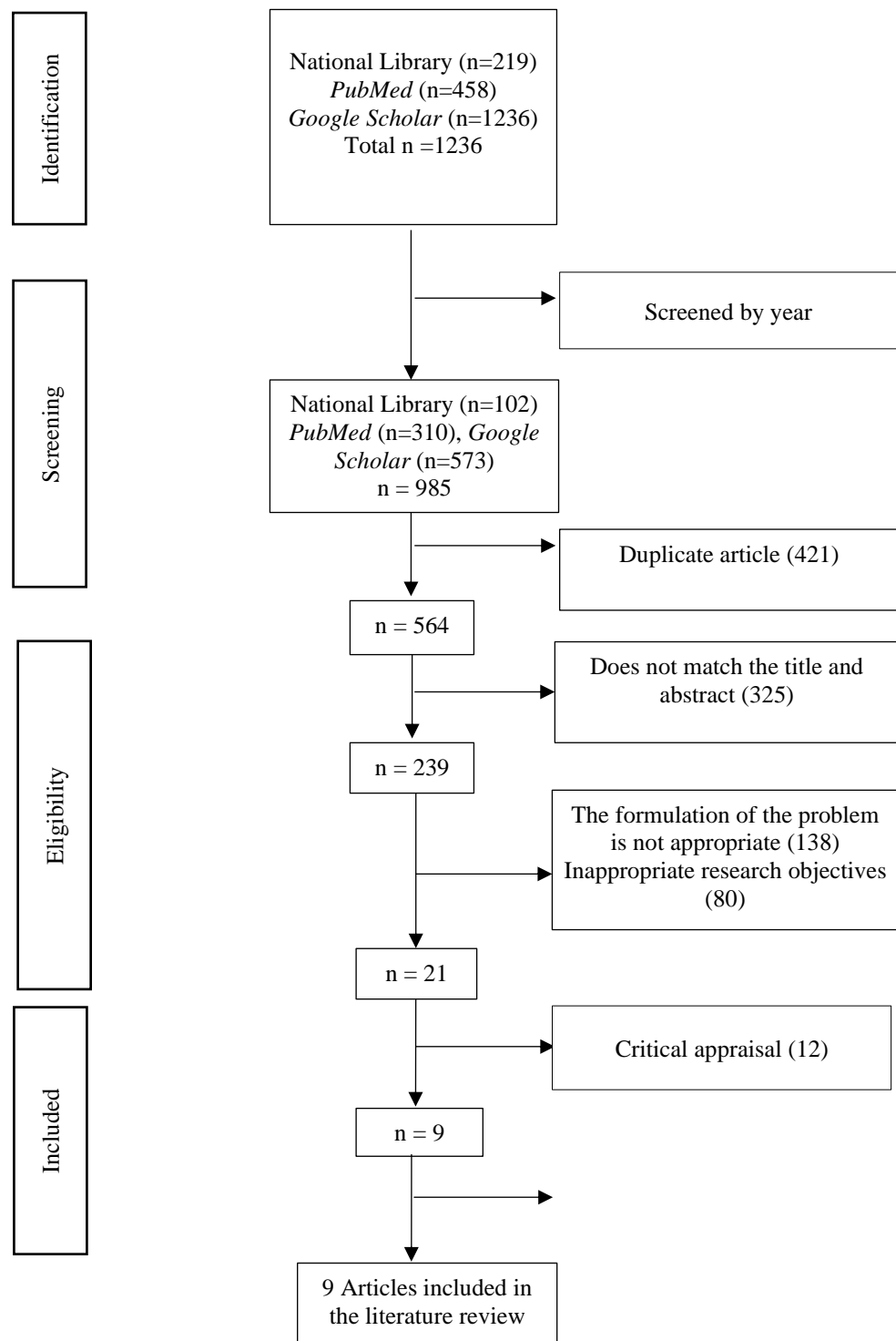


Chart 1. Article Search Process Prism Flow Diagram Modification
Source: Liberati et al. (2009)⁹

Table. 1 Article Search Results

No	Author	Year	Title	Method	Results
1.	Huang et al	2019	The effect of a 12-week home-based walking program on reducing fatigue in women with breast cancer undergoing chemotherapy: A randomized controlled study	The method used is a randomized controlled trial, by taking a sample of women from the Northern Taiwan health center. The intensity of brisk walking exercise is moderate and increases (gradually) by 30%-70% heart rate percentage.	At the end of the 12-week exercise program, the exercise group had less fatigue than the attention control group, and this group difference was maintained throughout the study period as a whole.
2.	Chan et al	2018	Tai Chi exercise is more effective than brisk walking in reducing cardiovascular disease risk factors among adults with hypertension: A randomized controlled trial	The method used was a randomized controlled trial. Data were collected at baseline, 3 months post-intervention, and follow-up assessments at 6 and 9 months. This model is commonly used to compare changes in outcomes over time between groups.	No significant changes in other cardiovascular disease risk indicators were observed over time between groups.
3.	Bernard et al	2018	Influence of a brisk walking program on postural response in sedentary older women: A randomized trial	The method used is a randomized controlled trial. Weekly brisk walking program on flat ground and consists of three weekly sessions for 60 minutes and 6 months.	The results showed a lack of systemic effect of 6 months of walking on flat ground on kinematic postural respondents.
4.	Sun et al	2018	Effects of Tai Chi Chuan and Brisk walking exercise on balance ability in elderly women: A randomized controlled trial	The method used is a randomized controlled trial. The exercise was carried out for 60 minutes consisting of 5 sessions per week for 16 weeks.	The results showed an increase in the ability to balance.

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5.	Blain et al	2017	Effect of a 6-month brisk walking program on walking endurance in sedentary and physically deconditioned women aged 60 or older: A randomized trial	The method used is a randomized controlled trial. Women were randomly assigned to a 150-minute/week brisk walking program (2 supervised sessions and 1 independent session per week) for 6 months.	Results recommend that brisk walking programs improve walking endurance in physically deconditioned women
6.	Chen et al	2016	Effects of brisk walking and resistance training on cardiorespiratory fitness, body composition, and lipid profiles among overweight and obese individuals	The method used is a randomized controlled trial. The brisk walking group was required to briskly walk 3 times a week with an intensity of 60-70% of each predicted maximum heart rate for 8 weeks.	The results showed that brisk walking and resistance training for 8 weeks reduced several cardiovascular risk factors among overweight and obese individuals.
7.	Abdullah et al	2016	The effectiveness of aerobic exercises at difference intensities of managing blood pressure in essential hypertensive technology officers	The method used is a randomized controlled trial. Respondents were given aerobic brisk walking interval training for four weeks, namely 45 minutes per day four times a week using a treadmill.	The results showed that the three intensities of aerobic exercise were effective in managing systolic and diastolic blood pressure. However, moderate-intensity aerobic exercise was found to be very effective in managing blood pressure compared to low- and high-intensity exercise.
8.	Gába et al	2016	The effect of brisk walking on postural stability, bone mineral density, body weight and composition in women over 50 years with a sedentary occupation: A randomized controlled trial	The method used is a randomized controlled trial. A 10-week walking intervention based on self-regulated brisk walking (BW) to or from work for 30–35 minutes at least 5 times per week.	The results showed that the effect of the intervention was influenced by the basic body mass index on body weight, fat mass, and visceral adipose tissue.

9.	Wu et al	2015	Effects of an 8-week outdoor brisk walking program on fatigue in hi-tech industry employees: a randomized control trial	The method used is a randomized controlled trial. Brisk walk for 8 weeks.	The results showed that an 8-week outdoor brisk walking program significantly increased fatigue levels.
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Discussion

Based on the results of the analysis of nine articles, it was found that there were varying results on the implementation of brisk walking. The first result can be seen that brisk walking provides good benefits for some respondents. Brisk Walking is the activity of choice for millions of people. Regular physical activity will help prevent premature death and the incidence of chronic diseases. Research shows that everyone who does regular physical activity can increase life expectancy. Brisk walking is generally safe for most people. Evidence has shown the health benefits of at least 10 minutes of brisk walking per day or 70-90 minutes per week. These benefits include increased physical fitness, ease of performance in daily physical activities, improved mood, improved quality of life, and a 15% reduction in the risk of premature death. This is in line with the research conducted by Sitorus, et al (2019) where in their research the results showed that brisk walking had a significant effect on weight loss with = 5% (0.05).¹⁹

A brisk walking exercise is a form of moderate activity exercise in hypertensive patients using a brisk walking technique for 20-30 minutes with an average speed of 4-6 km/hour. The advantage of this exercise is that it is quite effective in increasing the maximum capacity of the heart rate, stimulating muscle contraction, breaking down glycogen, and increasing tissue oxygen. This exercise can also reduce plaque formation through increased fat utilization and increased glucose utilization.²⁰ Brisk walking exercise also has an impact on reducing the risk of mortality and morbidity in hypertensive patients through the mechanism of burning calories, maintaining body weight, helping the body relax, and increasing beta-endorphins which can reduce stress and the safety level of applying brisk walking exercise at all age levels of people with hypertension.²⁰ This is in line with research conducted by Andrianti and Ikhsan (2019) which showed that there was a significant effect of the brisk walking exercise program in the intervention group which was stronger than in the control group where the mean systolic pressure of the intervention before the intervention (154.00±10.75) with a range (140-170) and after intervention (140.00±8.17) with a range (130-160) (p-value=0.001). In the control group, the mean systolic pressure was (143.00±8.23) in the range (130-150) and after two months (135.50±5.50) in the range (130-150). The mean diastolic pressure (intervention group) before (97.00±6.75) with a range (90-110) and after (85.00±4.71) with a range (80-90). Control group (93.00±6.32) with a range (80-100) and after (89.00±5.16) with a range (85-95) (p-value=0.001).²¹

Based on the results of the analysis, there were also three articles that showed that brisk walking had less effect on some respondents. The brisk walking exercise program is a form of a series of physical exercises that are carried out systematically and functionally to maintain health and improve physical fitness. Brisk walking is a health exercise (aerobic) that requires oxygen as a source. The brisk walking activity can only be called exercise if it is done continuously, for a minimum of 30 minutes every day. For cardiac exercises, the calculation of the training zone is 60% - 80% of the maximum pulse rate. If it is not carried out continuously and only for a short time, it may not have a significant effect. In addition, the effectiveness of brisk walking on hypertensive patients is strongly influenced by many factors, so if other things are not considered, it will not provide many benefits.²² Also in obese patients, brisk walking does not have much effect. This is in line with the research

conducted by Nuryanto, et al (2016), where their results showed that there was no significant effect of brisk walking on liver function in central obesity. In this study, it was explained that the cause of the absence of a significant relationship between physical activity and waist circumference in respondents with central obesity could be due to several factors. Several factors, namely nutritional intake, family size, lifestyle, namely smoking habits, stress and depression conditions.²³

Based on the results of the analysis, it was also found that the success of brisk walking is influenced by many factors, one of which is the brisk walking movement itself, where this movement must be done in the right way. The movement is done constantly and adjusted so that the feet always touch the earth. If one foot is raised to step forward, then the other foot must remain on the ground so that one foot is still interacting with the ground. In this fast walking sport, the feet are prohibited from floating or jumping because the basic rule is that they must not lose contact or touch with the ground, where at least one foot must always be in contact with the ground. In addition, several things must also be considered, such as contraindications to doing physical activity and or brisk walking in hypertensive individuals as well as physical exercise in general, namely unstable angina, uncontrolled hypertension (TDS = 160 mmHg and TDD = 100 mmHg), ventricular arrhythmias uncontrolled, acute congestive heart failure, severe aortic stenosis, 3rd degree AV block, acute myocarditis, pericarditis, endocarditis, uncontrolled metabolic disease, hypertrophic cardiomyopathy, musculoskeletal disorders.²⁴

According to the data, the researcher found out that the benefits of brisk walking exercise are various in improving the specific organs and the system of the body such as cardio and respiratory endurance, body fats reductions and the impacts of the brisk walking exercise contributes to reducing morbidity and mortality rates by preventing premature death due to some chronic illness such hypertension. Studies have proved that brisk walking exercise is safe to be done for everyone of all ages, and it is required not more than just a commitment of an individual to do it continuously in the recommended range of activities given.

Conclusion

Based on a literature review of nine articles, it can be concluded that brisk walking provides more benefits in reducing fatigue levels, lowering the cardiovascular risk (including hypertension), preventing a decrease in postural stability and reducing the risk of falls, and improving the ability to balance the elderly. This exercise can also be recommended for anyone who wants to live a healthy life and is recommended to be done at home with the implementation according to the recommendations. The ineffectiveness of brisk walking can also be influenced by several factors so before doing this exercise, the indications and contraindications should be considered.

Conflict of Interest Declaration

No potential conflict of interest relevant to this article was reported.

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