STRADA Jurnal Ilmiah Kesehatan
DOI: 10.30994/sjik.v10i1.546
ISSN: 2252-3847 (print); 2614-350X (online) Vol.10 No.1 May 2021 Page. 722-728

Maintaining Physical Fitness Through Cardiovascular Exercise Models: Literature Review

Haryo Widodo, Oce Wiriawan, Wijono
Universitas Negeri Surabaya, Indonesia
** Correspondent Author: haryo.19007@mhs.unesa.ac.id*

ABSTRACT
Physical fitness is an interpretation of the heart's endurance ability to maintain maximum body performance without fatigue for a certain period of time. The parameter as a marker of a person's physical fitness is a high VO2max value. Efforts to improve or maintain physical fitness can be done through cardiovascular or cardiovascular endurance training. This study aims to conduct a literature review on maintaining physical fitness through cardiovascular exercise. This study used a literature review method with a focus on cardiovascular exercise to maintain health from previous studies. A selection of literature comes from national or international journals on safe google scholar, science direct, and research gate with the publication period 2010-2021 and keyword searches for cardiovascular exercise / cardiovascular endurance or cardiovascular training to improve physical fitness. The journal review technique uses a synthesis matrix by creating a table consisting of columns of reference sources, samples, methods, interventions, and findings. The results in this study were adapted as many as 13 reviewed articles. The conclusion in this study is that there are many kinds of cardiovascular exercise. Which various types of cardiovascular exercise can actually maintain and even improve physical fitness.

Keywords: Physical Fitness, Cardiovascular Exercise, Literature Review

Received February 17, 2021; Revised March 17, 2021; Accepted April 17, 2021

STRADA Jurnal Ilmiah Kesehatan
DOI: 10.30994/sjik.v10i1.546
ISSN: 2252-3847 (print); 2614-350X (online) Vol.10 No.1 May 2021 Page. 722-728

BACKGROUND

Health is something that is very important for humans. Health must always be maintained by everyone in order to avoid disease. This is because without good health, every human being will find it difficult to carry out their daily activities. The denser the activities that a person does make it neglect the problem of training. Lack of free time due to busy activities at the office, on campus, at the company, causing a person to take up the opportunity to do exercises. Basically, training is a necessity for every human being in life, so that their physical condition and health are well maintained. Therefore, humans want to try to maintain their health and one way to maintain good health is through exercise. Exercise is useful in maintaining and improving physical fitness. If a person is fit, it shows that the quality of his health is good (Prasetyo, 2013).

Physical fitness functions to develop individual work abilities, so that they can complete tasks well without experiencing significant fatigue (Soraya et al., 2019). Having a good physical fitness status and an ideal body is everyone's hope (Dwicahya and Arjuna, 2017). Physical fitness is related to exercise. This is because exercise greatly affects a person's physical fitness, moreover, this activity contributes directly to the components of physical fitness. It should be noted that training still has to be adapted to a person's age, for example the type of exercise, safety factors and the equipment used. Exercises cannot be done haphazardly, they still have to be done with the right techniques and rules. Even though you are happy with training, you still have to look at your age and physical condition so that they are well controlled (Prativi, Soegiyanto, and Sutarji, 2013). Then what kind of exercise is recommended in maintaining physical fitness. According to the American College of Sports Medicine (ACSM) recommends cardiovascular exercise to improve physical fitness (Garber et al., 2011).

Previous research by Candrawati, et al., (2016) stated that aerobic exercise interventions can affect changes in muscle flexibility and heart endurance. Combined interval training using an intensity of 60-90% DNM for 3 minutes in 1 set with a recovery ratio of 1: 1/2 in 3 times for 6 weeks can increase heart endurance (Dirgantoro, Edwin W., Shadiqin AR., And Siti Aisyah. 2018). According to Dharma, Utari Septia and Elman Boy., (2019) recommendations for aerobic training in maintaining fitness in the cardiovascular aspect can be done by paying attention to the frequency of exercise 2, 3, or 6 times with an intensity of 60-80% DNM. The duration can be adjusted according to the frequency and intensity with a choice of 20-60 minutes. This type of aerobic exercise can be jogging, cycling, swimming or walking. Sprint - jogging - rest interventions (short distance intervals) can increase Vo2max (Kumbara, Hengki and Feri Wiratama, 2021). However, cardiovascular exercise models that can maintain physical fitness are still unclear.

On the basis of the above background, it is necessary to do a literature review on Maintaining Physical Fitness through the Cardiovascular Exercise Model.

METHODS

This study used a literature review method with a focus on reviewing cardiovascular exercise to maintain health from previous studies. The selection of literature comes from national or international journals in safe google scholar, science direct, and research gate with a publication period in 2010-2021 and keywords searching for cardiovascular exercise / cardiovascular endurance or cardiovascular training to improve physical fitness. The journal review technique uses a synthesis matrix by creating a table consisting of columns of reference sources, samples, methods, interventions, and findings.

STRADA Jurnal Ilmiah Kesehatan
DOI: 10.30994/sjik.v10i1.546
ISSN: 2252-3847 (print); 2614-350X (online) Vol.10 No.1 May 2021 Page. 722-728

RESULTS

The review process is carried out on scientific articles that have been selected based on the keywords cardiovascular training or cardiovascular training to improve physical fitness. A total of 11 national journals and 2 international journals have been reviewed based on reference sources, types of samples, research methods, interventions given to the findings.

Table 1 . Journal review

Reference source	Sample	Research methods	Intervention	Findings
Candrawati, et al., 2016	33 individuals aged 25-35 years	Experimental method with preliminary and final test designs	Aerobic exercise 3 times a week with a duration of 60 minutes for 12 weeks	Aerobic exercise interventions can affect changes in muscle flexibility and cardiac endurance with an increasing trend of change.
Dharma, Utari Septia and Elman Boy. , 2019	-	*Literature review*	-	Aerobic training recommendations in maintaining cardiovascular fitness aspects can be done by paying attention, the frequency of exercise is 2, 3, or 6 times with an intensity of 60-80% DNM. The duration can be adjusted according to the frequency and intensity with a choice of 20-60 minutes. This type of aerobic exercise can be *jogging,* cycling, swimming or walking.
Dirgantoro, Edwin W., Shadiqin AR., And Siti Aisyah. 2018	11 club members	Experimental method with preliminary and final test designs	*bike interval training is* done in 3 times for 6 weeks	Combined *interval training* using an intensity of 60-90% DNM for 3 minutes in 1 set with a *recovery* ratio of 1: 1/2 in 3 times for 6 weeks can significantly increase cardiovascular endurance
Gunawan, Andre., Hedison Polli, and Damajanty HC. Security. 2015	20 female zumba athletes aged 17-19 years	Experimental method with preliminary and final test designs	Zumba exercise for 60 minutes then *jogging* ± 1.6 km	The interventions given are able to significantly improve cardiorespiratory fitness

DOI: 10.30994/sjik.v10i1.546
ISSN: 2252-3847 (print); 2614-350X (online) Vol.10 No.1 May 2021 Page. 722-728

	with ideal BMI			
Hidayatulloh, Dede T., Moch Asmawi, and Bambang S. 2018.	30 junior high school level pencak silat athletes	Development research methods	Game-based cardiovascular endurance training model	16 game-based exercise models to increase cardiovascular endurance were deemed feasible and had a significant effect on the *Vo ₂max* sample
Kumbara, Hengki and Feri Wiratama. 2021	24 high school students	Experimental method with preliminary and final test designs	Short distance interval training in 36 divided hours 3-4 times / week	Intervention *sprint* - *jogging* - break (short distance intervals) can improve the *Vo ₂max* was significantly
Lin, et al. 2015	-	*Sytematic review*	-	Physical activity that is done regularly can affect the fitness of the endurance of the heart and several biomarkers of metabolic disease. The effects of physical activity can be controlled through age, gender , health status and lifestyle
Nugraha, Andika Ridwan and Khairun Nisa Berawi. 2017	-	*Literature review*	Exercise using the *high intensity interval training* method	The HIIT method trains the heart's endurance ability at an intensity limit of 80-170% in the presence of work and rest intervals.
Peralta, et al., 2020	-	*Sytematic review*	-	Learning PJOK contributes to developing students' physical fitness by influencing factors of intensity, age, and weight status.
Personal, Agus. 2015	-	*Literature review*	Aerobic training model for the elderly	Aerobic exercise recommendations can be done by cycling, swimming, elderly exercise, and walking. Exercise frequency is performed 3-5 times a week with 60-70% DNM and within 20-30 minutes. The principle of *overload* is

DOI: 10.30994/sjik.v10i1.546
ISSN: 2252-3847 (print); 2614-350X (online) Vol.10 No.1 May 2021 Page. 722-728

				preferred by increasing the duration of the exercise.
Rahmawati, Silvia., Budiyanti, Nina Indriyawati. 2016.	21 elementary school students aged 10-12 years	Pre-experimental method with preliminary and final test designs	Skiping exercise for 10 minutes duration for 8 meetings	The interventions given help improve cardiac endurance in children aged 10-12 years.
Sukma, Rachmawati, Fitriana Puspa H., and Mimi Haetami. 2020	10 vocational students	Experimental method with preliminary and final test designs	The fartlek training model starts with 5-10 minutes of *jogging* , 20 m *sprints* , 20 m *step runs* , 50 m *sprints* , brisk walking, *jump sprints,* and 400 m *speed training.*	Exercise intervention model is done in a disciplined manner that can affect cardiac endurance
Widiyanto. 2008	-	*Literature review*	-	Recommendations for maintaining cardiovascular fitness can be done with a frequency of 3-5 days of exercise a week. Exercise intensity of 60-90% in a duration of 20-60 minutes .

DISCUSSION

Physical fitness is an interpretation of the ability of the heart's endurance to maintain maximum body performance without fatigue within a certain period of time. The parameter as a marker for a person to have physical fitness is a high VO2max value. VO2max is the body's ability to process oxygen volume for activities. This shows that the higher the VO2max value, the less likely a person will experience fatigue. Efforts to improve or maintain physical fitness can be done through cardiovascular or cardiovascular endurance training.

Based on the results of reviews from several previous journals which are presented in table 1, there are several training models that can be used as guidelines for developing cardiac endurance abilities. Some of these exercises can be classified into aerobic and anaerobic exercise types. Aerobic exercise is recommended in the form of aerobic exercise (Candrawati, et al., 2016), zumba (Gunawan, Hedison, and Pengemanan, 2015) or in the form of aerobic activities such as walking, jogging, cycling, and swimming (Dharma, Utari and Elman, 2019). Whereas aerobic exercise is recommended in the form of game models

DOI: 10.30994/sjik.v10i1.546
ISSN: 2252-3847 (print); 2614-350X (online) Vol.10 No.1 May 2021 Page. 722-728

(Hidayatulloh, Asmawi, and Bambang, 2018.), interval training (Dirgantoro, Shadiqin, and Aisyah, 2018; Kumbara, and Feri, 2021; Nugraha and Berawi. 2017), and fartlek (Sukma, Fitriana, Mimi, 2020). The recommended form of exercise depends on choosing a person who does it in accordance with the supporting training ability factors, such as gender, age, maximum pulse rate, and their medical history.

Aerobic exercise is a type of exercise that requires a long duration of time or performs continuous movements with low intensity and without rest. Sudarsono (2008) places several criteria for aerobic exercise by taking into account the criteria for intensity, duration, and type of exercise. The intensity of aerobic exercise ranges from 60-80% with a duration of 20-60 minutes and the types of activities that can be done are walking, jogging, cycling, and swimming. The frequency of aerobic exercise can be done 2, 3, 5, or even 6 times a week (Widiyanto, 2008; Pribadi, 2015; Dharma, Utari and Elman, 2019) depending on the intensity, duration and type of exercise by prioritizing the principle of adding to the duration of the exercise. (Personal, 2015).

Anaerobic exercise is a type of exercise that requires resting time to reach high intensity, meaning that there is an intervention of rest intervals and body performance in the training process. This results in a short training time but the impact of the training is very large. The type of exercise used can be in the form of sprints, workout moves, or preferred movements. The method of implementing aerobic exercise can be done by manipulating between exercise time (body performance) and rest time. Dirgantoro, Sadiqin, and Aisyah (2018) state that time manipulation can use comparisons, for example a ratio of 1: 3 with a unit ratio of 10 seconds, then 10 seconds of body performance time and 30 seconds of rest time (active or passive). Intensity manipulation can reach above 80% maximum pulse rate (Nugraha and Berawi. 2017), while the duration of training depends on the manipulation of rest time, performance, intensity, and type of exercise. Furthermore, there is a fartlek training model which starts with 5-10 minutes of jogging, 20 m sprints, 20 m step runs, 50 m sprints, brisk walking, jump sprints, and 400 m speed training (Sukma, Fitriana, Mimi, 2020). These training models share a common guideline that manipulates exercise intensity and rest duration.

The explanation above shows that there are various kinds of cardiovascular exercises that can maintain and even improve physical fitness. This shows that physical fitness is obtained by proper training, namely the type of cardiovascular exercise

CONCLUSION

There are various kinds of cardiovascular exercise. Various types of cardiovascular exercise can actually maintain and even improve physical fitness.
It is necessary to carry out further studies on cardiovascular exercise that is most efficient in terms of age range, so that every age can apply the right type of cardiovascular exercise.

REFERENCES

Candrawati, Susiana., Evy Sulistyaningrum, Dicky Bramantya AP, Nurvita Pranasari. 2016. *Senam Aerobik Meningkatkan Daya Tahan Jantung Paru dan Fleksibilitas.* Jurnal Kedokteran Brawijaya. Vol. 29 (1) 69-73

Dharma, Utari Septia dan Elman Boy. 2019. *Peranan Latihan Aerobik dan Gerakan Salat terhadap Kebugaran Jantung dan Paru Lansia.* Magna Medica. Vol. 6 (2) 122 - 129

Dirgantoro, Edwin W., Shadiqin AR., dan Siti Aisyah. 2018. *Pengaruh Bike Interval Training terhadap Peningkatan Daya Tahan Jantung Paru Anggota Club Cycle Bajai.* Multilateral. Vol. 12 (1) 13-17.

DOI: 10.30994/sjik.v10i1.546
ISSN: 2252-3847 (print); 2614-350X (online) Vol.10 No.1 May 2021 Page. 722-728

Dwicahya, N. dan Arjuna, F. 2017. *Pengaruh Latihan Circuit Bodyweight terhadap Kebugaran Jasmani, Indeks Massa Tubuh, Presentase Lemak Tubuh dan Fleksibiltas.* Jurusan Pendidikan Kesehatan dan Rekreasi FIK UNY.

Garber, Carol E. Et al. 2011. Quantity and Quality of exercise for developing and Maintaining Cardiorespiratory, Musculoskeletal, and Neuromotor Fitness in Apparently Healthy Adults: Guindance for Prescribing Exercise. American College of Sports Medicine, DOI:10.1249/MSS.0b013e318213fefb.(1334 -1359).

Gunawan, Andre., Hedison Polli, dan Damajanty HC. Pengemanan. 2015. *Pengaruh Senam Zumba terhadap Kebugaran Kardiorespiratori.* Jurnal e-Biomedik. Vol. 3(1) 48-52.

Hidayatulloh, Dede T., Moch Asmawi, dan Bambang S. 2018. *Model Latihan Berbasis Permainan Meningkatkan Daya Tahan Cardiorespiratory Atlet Pencak Silat Usia SMP.* Journal Sport Area. Vol. 3(2) 131-139

Kumbara, Hengki dan Feri Wiratama. 2021. *Pengaruh Latihan Interval Jarak Pendek terhadap Daya Tahan Jantung Paru pada Siswa SMAN 1 Gelumbang.* Halaman Olahraga Nusantara. Vol 4 (1) 66-76

Lin, Xiaochen., Xi Zhang, Jianjun Guo, Christian KR., Steve McKenzie, Wen-Chih, Simin Liu, and Yiqing Song. 2015. *Effects of Exercise Training on Cardiorespiratory Fitness and Biomarkers of Cardiometabolic Health: A Systematic review and Meta Analysis of Randomized Controlled Trials.* American Heart Association

Nugraha, Andika Ridwan dan Khairun Nisa Berawi. 2017. *Pengaruh High Intensity Interval Training (HIIT) terhadap Kebugaran Kardiorespirasi.* Majority. Vol. 6(1) 1-5.

Peralta Miguel., Duarte Henriques N., Elvio Rubio Gouveia, Luis B. Sardinha, Adilson M. 2020. *Promoting Health Related Cardiorespiratory Fitness in Physical Education: A Systematic Review.* PloS ONE. Vol. 15 (8).

Prativi, G.O., Soegiyanto., Sutardji. 2013. Pengaruh Aktivitas Olahraga terhadap Kebugaran Jasmani. *Journal of Sport Sciences and Fitness*., 2(3): 32-36.

Pribadi, Agus. 2015. *Pelatihan Aerobik untuk Kebugaran Paru Jantung bagi Lansia.* Jurnal Olahraga Prestasi. Vol. 11(2) 64-76.

Rahmawati, Silvia., Budiyanti, Nina Indriyawati. 2016. *Pengaruh Latihan Skipping terhadap Peningkatan Cardiovascular Endurance pada Anak Usia Sekola 10-12 Tahun.* Jurnal Riset Kesehatan. Vol. 5 (2) 112 -118.

Soraya, I., Sugihartono, T., Defliyanto. 2019. Pengaruh Latihan SKL 2018 Terhadap Peningkatan Kebugaran Jasmani Mahasiswa Puti Penjas UNIB. *Jurnal Ilmiah Pendidikan Jasmani*, 3(2): 249-255.

Sudarsono, C. Kebugaran. Kuliah Pengantar pada Kelas Foundation; 2008

Sukma, Rachmawati, Fitriana Puspa H., Mimi Haetami. 2020. *Pengaruh Latihan Fartlek terhadap Daya Tahan Kardiovaskuler.* Jurnal Olahraga. 1-9

Widiyanto. 2008. *Respon Kardiovaskuler Akibat Latihan.* Medikora. Vol. 4 (1) 24-46.