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High Intensity Tabata Bodyweight Training Increasing Maximum Oxygen Volume in Students

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Abstract

Tabata workouts are exercises that use intensity with monotonous and numerous movements that pile up an injury. In the research, this researcher modified exercise tabata using bodyweight training to motivate students when they exercise with the Tabata model. Besides, modification intensity supports students who are spared from frequent injuries, especially athletes who exercise tabata with intensity. Research purposes This is for known influence exercise tabata to increase students' VO^2Max with modification movement and intensity that has been modified. The type of research used is a study experiment with design one group pretest-posttest design research. 11 students will participate in a study; they will do exercise tabata with an intensity of 80-90% 3 times a week for 3 weeks. The entire subject involved in the study is active students who do physical activity at least 2 times a week. The paired sample t-test was used in the study. The research result is that there is a difference between pre and post-surgery students who exercise tabata for 3 weeks ($p \leq 0.05$) with an increase in VO^2Max by 15.93%. Conclusions study This exercise tabata for 3 weeks is capable of increasing VO^2Max in students. Modified Tabata workout with bodyweight training movements with 8 different movements gives significant enhancement to students' VO^2Max.

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INTRODUCTION

In life, everyone's fitness is essential. For can do activities daily without feeling excessive tiredness (Ruscheweyh et al., 2011). There are also other related opinions quoted. Journal according to (Ruscheweyh et al., 2011), " Fitness physical is the ability To do activity daily with enthusiasm and full awareness, done without meaning fatigue, with increasing energy For enjoy time (Kapoor et al., 2022). Physical fitness enhancement: Of course, some things can influence the growth and development of corporeal, gender, and age (van Uffelen et al., 2017). With walking time and level of fitness, somebody's number of days decreases, especially in circles, and the lack of teenage guards' conditions his body. More or less related to this matter, one of the health institutions in Indonesia aims to increase physical activity, especially among teenagers, by 10% in 2025 and 15% in 2030 (Andriyani et al., 2020). We expect health in a healthy, fit, and productive society. However, no matter this, improvement in physical activity can become the only policy (Barreto et al., 2013). From the data obtained, estimated time No active related activity physique shows that 27.5% adults and 81% teenagers classified less in 2016, trend data shows a global increase in 2016 (Risky Candra Swari, 2021). Therefore, institutions or related institutions with matter must quickly do movements to get good results, and that is a national movement. And its essential socialization guard's physical fitness among teenagers and adults.

According to Amin Sulistiono (2014), one of the factors affecting the condition of somebody's physique is the quality of the food he receives. Other factors include age, gender, body shape, health status, weight, habits, rest, and activity physique (Mukti, 2014). Besides that, physical fitness is influenced by the index mass body and exercise (Salamah, 2019). Physical training can prevent various diseases like heart disease, cancer, type 2 diabetes, osteoporosis, and injury (Sugiharto et al., 2023). Do exercise physically to reduce stress, anxiety, and depression, as well as increase concentration, quality rest, and trust yourself (Ji et al., 2022).

VO^2Max says deep activity physique. Of course, No foreign. VO^2Max is the amount of maximum O_2 processed body man during an intense activity (Khairi & Syahwani, 2021). VO^2Max is the level of capacity of oxygen in the body expressed in milliliters/minute/kg body weight. Based on the body's oxygen capacity, someone can evaluate whether he is tired fast or slow. Movement results in the body's being reflected in the oxygen capacity maximum. It is known that oxygen is material burned or the source of the main life body. Muscles need oxygen for activities heavy or light. VO^2Max also has an oxygen volume maximum (VO^2Max). The primary purpose of exercise resilience is to increase the performance of the heart, as well as the function of the lungs and the circulation of blood. The third component is what happened to base development talent. According to Kane et al. (2016), exercise tabata in exercise physiques is seldom applied because several coaches who don't know how to profit from exercise and doubt deeply carry out exercises with variation methods of exercise tabata. Another problem with practice training is using method research on the nature of each method. It is Still Not yet clear. Understanding the limitations of something method is one of the limitations of a coach in the training process.

Urgency from study This is to apply the knowledge we already have to the article about the influence of exercise tabata to increase VO^2Max in Coaching Education students Sports, Faculty Knowledge Sports and Health, Surabaya State University. Study This has a similar base to the article researched (Rangga & Putra, 2017) entitled " Effectiveness of bodyweight training exercises with method Tabata for increasing fitness of physical students in the 2016-2017 education year coaching sports FKIP PGRI Adibuana University ". To respond to the urgency of the problem above, the study aims To prove the influence of high-intensity Tabata bodyweight training on maximum oxygen volume in students. Expected results study This can help coaches and athletes produce optimal maximum oxygen volume through intervention in high-intensity Tabata, which is effective and efficient bodyweight training.

METHODS

This study was pre-experimental with one group pretest-posttest design. A total of 11 students aged 18-21 years follow participated in the study. Intervention high-intensity Tabata bodyweight training was carried out with frequency 3x/ week for 3 weeks. Exercise movements tabata on research this, among others, push, Russian twists, uneven plank, mountain climbers, jumping jacks, lunges, burpees, and standing abs twists. Movements were made using a ratio (40:20): 40 seconds of exercise and 20 seconds for rest between movements. This exercise is done with a total of 3 sessions, and there is recovery with a time of 3 minutes between sets. Deep training study This was done for three weeks. Using a training volume of 3 times deep a week (Tuesday, Thursday, Saturday) with intensity high (80-95%) (Putera et al., 2023; Wahyono et al., 2024).

Multi-Stage Fitness Test (Bleep Test) was a test that was carried out to measure VO^2Max capacity with steps as follows: First, measure the distance used For running. The distance is 20 meters, and there are 2 points. Second, the participants' test start run coincides with the beep sound on the sound. Third, every beep sound participant test is also a must. It is already at the end trajectory with the distance specified (20 meters). Fourth, the participants' test forbidden run precedes the "beep" sound, and the officer must supervise the participant's test. Fifth, when the participant has Not yet reached a point with a specified distance moment, A "beep" sound sounds, and the participant is given a warning and must still run until they reach the point at a spur speed so as not to be late for the next "beep" sound. Sixth, when the participant test was late twice consecutively, the participant test was considered to have already been eliminated from the beep test at once, which became a sign of an achieved beep test score. Statistic test descriptive used in the analysis of subject data profile and results research. Normality test using the Shapiro–Wilk test was used as a precondition for the paired sample t-test in distinguishing pre-test and post-data exercise tabata for 3 weeks. Study This uses SPSS version 23 software to form a researcher in data analysis.

RESULT

Based on the results, the study shows that the number of subjects specified in the research totaling 11 people, with provision age 18-21 years; the average height of the subjects is 1.65±0.06, with the lowest height being 1.58 m and the highest being 1.73 m. The average body weight of the subjects was

58 kg. The lowest weight was 44.60 kg, and the heaviest was 71.50. Meanwhile, the average BMI of the subjects was 21.30 kg/ ^{m2}, with the lowest BMI value being 17.60 kg/m ^{2,} and the highest BMI value being 26.70 kg/m ^{2}. He explained more in Table 1.

Table 1. Descriptive Subject Study

No.	Variable	n	Mean ± SD	Min	Max
1	Age (Years)	11	19.36±0.80	18.00	21.00
2	Height (m)	11	1.65±0.06	1.58	1.73
3	Weight (kg)	11	58.42 ± 9.10	44.60	71.50
4	Body mass index (kg/m^2)	11	21.30 ± 3.10	17.60	26.70

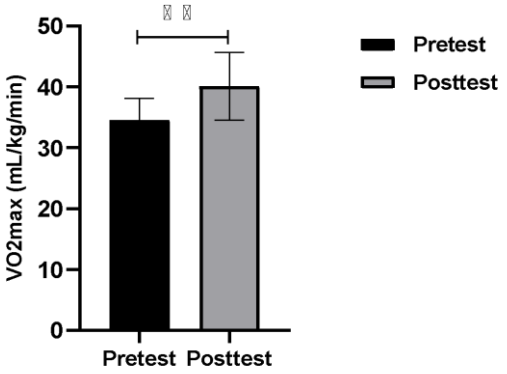

Figure 1. Average VO2Max pretest and posttest (**) Significant with pretest ($p \leq 0.001$).

The average pretest VO^{2}Max was 34.58 mL/kg/min, with the mark lowest at 26.80 mL/kg/min and the value highest at 40.50 mL/kg/min. Meanwhile, the average VO^{2}Max at posttest was 40.09 mL/kg/min, with the mark lowest at 31.8 mL/kg/min and the value highest at 51.40 mL/kg/min. The average difference between the pretest and posttest was 5.51 mL/kg/min. Based on the results, normality test analysis shows that the mark significance amounting to 0.213 more of $p \geq 0.05$ for the VO^{2}Max pretest, whereas the results of VO^{2}Max posttest analysis show a mark significance amounting to more than 0.898 from $p \geq 0.05$, so it can be concluded that data normally distributed. The different paired sample t-tests show a significant average VO^{2}Max difference between the pretest and posttest (34.58 ± 3.53 vs 40.09 ± 5.54 mL/kg/min, p=0.001).

DISCUSSION

Study This produced results where exercise tabata for 3 weeks is capable of increasing VO^{2}Max by 15.93%. Research results in This is The same with research carried out by (Wijaya & Syafi, 2018), who stated exercise tabata Can increase VO^{2}Max. Interesting in study This there is an increase in VO^{2}Max by 15.93% with exercise for 3 weeks If compared to the results research by (Lipecki, 2018), which states there is an improvement in VO^{2}Max using bodyweight training by 6.1% in 10 weeks. Modification results in a movement exercise tabata using a deep bodyweight study. This proves that an increase in VO^{2}Max exists, which is an effective and efficient method.

Interesting stuff in research. This is exercise physics that uses normal body weight movements to increase power and strength. Research (Risky Candra Swari, 2021) states that bodyweight training is possible to increase power capabilities. In research, this enhancement aerobics is also available through bodyweight movements. Besides that, aerobic exercise requires 30 minutes of research (Wijaya & Syafi, 2018), which states that a 30-minute workout can increase the capacity of aerobics. However, in research, this time, active exercise is only 24 minutes (8 minutes for every session, and the number of sessions is 3) and is capable of increasing fitness. Durability includes component conditions and

physical requirements for doing various activities over a long period. Endurance is also very necessary, specifically when one is currently doing sport. Based on the results of the study, there is an influence exercise with method Tabata to increase VO2Max. This matter is proved with results based on the test Power stand use beep test contained in the attachment. According to (Wijaya and Syafi, 2018), practicing the method Tabata can do helps somebody develop resilience and increase muscle capacity, as well as muscle power. In research, this Tabata method is interval training with the use of moderate intensity (78-83%) consisting of short, intense exercise followed by short rest. Do exercise with an effort maximum of 40 seconds, followed by a rest of 20 seconds, repeat with a total of 8 minutes and with several sessions of 3, and pattern. This will be repeated in as many as 4 sets. Training tabatas are known for their efficiency and effectiveness in increasing cardiovascular fitness. With systematic training , energy aerobics, and regular physical activity, one can increase VO2Max (Putra et al., 2017).

Oxygen volume is the maximum amount processed and used by the body during activity sports, known as VO2Max. This originates from the lungs and is distributed all over the body through blood vessels. VO2Max can be improved with method exercising routinely and programmed (Wen et al., 2019). With existing matter, somebody will benefit in a way maximum matter from burning of fat inside the body, improving fitness, improving Power stand muscles, and, of course, expediting daily activity (Ilissaputra & Suharjana, 2016). Fitness physically, according to (Darmawan, 2017), is something a state that everyone really wants. With fitness, people can come on stage more dynamically/enthusiastically and create productivity. Work. Fitness's influence is significantly positive to mobility students. When someone guards physical fitness, he tends to have more energy, height, and power to hold on more. The level of physical fitness of students also has an influence on performance Study student p This is supported by research (Subarjah, 2016), which states there is a positive connection between the level of fitness physical students to performance Study eye studying Badminton for PGSD physical education students at the Indonesian University of Education (UPI) campus Sumedang in West Java. Also, the research results by (Nurhidayat et al., 2020) state that there was a significant influence on the fitness and physical performance of academic fourth-semester students of POR FKIP UMS in 2019. Somebody can stay fit when doing an activity for a long time without feeling significant fatigue (Subarjah, 2016). One of the indicators of fitness level capacity is oxygen in the body (VO2Max) Based on the body's oxygen capacity, someone can evaluate whether he is tired fast or slow. This shows that exercise tabata significantly influences VO2Max increase. Sport can help a healthy body man. Structured exercise programs ensure that exercise is appropriate for desired goals and objectives. Limitations in the study: Only one group was used. Furthermore, only the 8 movements that have been determined by the researcher and used in 3 sessions of exercise and every 3 times a week for 3 weeks. A development study with complete group control, various movement lots, and additional session exercises is needed.

CONCLUSION

Based on the results, the study concluded that the high-intensity Tabata bodyweight training intervention, carried out with frequency 3x/ week for 3 weeks,

proved effective in increasing students' maximum oxygen volume, with an enhancement of 15.93%.

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