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Latib Mustofa
Faculty of Sports and Health Sciences, Yogyakarta State University, Yogyakarta, Indonesia

Endang Rini Sukamti
Faculty of Sports and Health Sciences, Yogyakarta State University, Yogyakarta, Indonesia

Iman Imanuddin
Faculty of Sports and Health Education, Indonesia University of Education, West Java, Indonesia

Corresponding Author:
Latib Mustofa
Faculty of Sports and Health Sciences, Yogyakarta State University, Yogyakarta, Indonesia

The effectiveness of online training on increasing Balikpapan runner's vo$_2$max in recreational sports

Latib Mustofa, Endang Rini Sukamti and Iman Imanuddin

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Abstract
Running is a very popular sport in Indonesia and is popular with all age groups. There is a running race from 5 km to 42,195 km, this can motivate runners to train more intensively. Online training attracts a lot of attention because it is packaged with the presentation of interesting training programs, so runners are interested in training online. The author uses quantitative descriptive research, with experimental methods. This study used a puprosive sample with a population of 3 men and 6 women with an age limit of 30 years to 45 years, a total of 9 people. The instrument taken by the author is the Balke test. It is known that the Sig value. (2-tailed) is 0.003 < 0.05, so there is a significant influence of providing online training programs on increasing Vo2max. And the percentage seen before treatment was 71% and after treatment 77%.

Keywords: Training programs, training control, evaluating, strength and conditioning, endurance and Vo2Max

1. Introduction
Running is part of the athletic sport, which is very popular and popular among all ages. In Indonesia itself, many people do this sport. Apart from being cheap, people don't need to prepare enough funds to run. With the popularity of running in Indonesia, there are many companies or special institutions that organize competitions, ranging from 5 km to 42,195 km. The more races there are, the more runners will want to take part. The runners in question can vary, some aim for health and some for achievement, as explained by Giriwijoyo *et al*. (2007, 26) [11]. Healthy sports are sports to maintain and/or increase the degree of dynamic health, so that people are not only healthy when they are still (Static Healthy) but are also healthy and have movement abilities that support every activity in daily life (Healthy dynamic) of a routine nature, as well as for recreational purposes and/or dealing with emergency situations. Meanwhile, sports achievements according to Law of the Republic of Indonesia no. 11 of 2022 Achievement Sports is a sport that fosters and develops athletes in a planned, tiered and sustainable manner through competition to achieve achievements with the support of sports science and technology.

Therefore, with many running races ranging from 5 km to 42,195 km, this can motivate runners to compete and practice running, so that each runner's goal is achieved. By taking part in direct training with sports coaches, there are even online virtual games that provide training programs that can attract runners to train efficiently without having to meet a coach. Determining whether exercise increases or not depends on the quality of the training provided, because training, according to Harsono (2015) [8], training is a systematic process of practicing or working, which is carried out repeatedly, with each day increasing the amount of training or work load. So ideally training requires an increase in training load. The 5 km to 42.195 km running race is a running sport that requires runners to have good endurance qualities, in other words, a runner's Vo2max must be sufficient in order to be able to finish the race they are participating in. Haugen (2022) [22] Training for long-distance running (LDR) aims to improve the “big three” performance-determining variables: maximum oxygen uptake (VO2max; the highest rate at which the body can take up and utilize oxygen during severe exercise), fractional utilization (the ability to sustain a high percentage of VO_2max when running), and

running economy (VO_2 at a given submaximal running velocity). Meanwhile, endurance is the body's ability to carry out activities/work for a long period of time without experiencing significant fatigue, accompanied by rapid recovery. Dan Harsono (2016) [9] Aerobic endurance is the state or condition of the body that is able to work or train for a long time, without experiencing excessive fatigue after completing the work or exercise. So it is not surprising that runners are active in training to increase their endurance because endurance is a supporting element for runners in taking part in competitions, and it is not surprising that runners also carry out training on the road and on the running track in order to prepare themselves for the competition.

The author carried out observations on 10 running communities in Balikpapan with the conclusion that there was an increase in online training and as for what was not, the training was not controlled and structured which caused obstacles to the runners' training process, runners not understanding how to read online training programs, then a lack of morals and special motivation for runners who carry out online training so that it has an impact on training results.

The results of several previous studies have identified variables including regarding the Effectiveness of Different Modalities of Remote Online Training in Young Healthy Males, in this study he stated that in summary, the present study results indicated that remote online training was effective in healthy young male adults for improving muscle and cardiovascular fitness. However, the livestreaming model with expert supervision appears to be the delivery modality that achieves the higher effects, especially on cardiovascular parameters these finding suggest that the online multicomponent physical exercise intervention is effective in enhancinh the physical performance of community -dwelling older adults. From the results of previous research evaluations, it was found that there was a strong and significant influence on online training. Next, the researchers updated the independent variables in Online Training with an age ratio of 30 years to 45 years, so that there were relevant differences in previous research [1, 2, 3].

2. Materials and Methods

This research uses quantitative descriptive research and the author took 10 Balikpapan runners who actively took part in running competitions. The data collection technique was carried out through the application of experiments, namely consisting of 1 pre-test before treatment, 90 times treatment (treatment), and 1 post-test after treatment. For 90 days runners will be given treatment in the form of an online program consisting of flexibility, strength, speed and endurance training with the dominant provision of endurance training, namely continuous run (Slow, Easy, Medium, High and Recovery), Interval Training (Principle Interval, Extensive and Intensive), Fartlek/Speed Play and Cross Country.

Researchers used a purposive sample because it had to be in accordance with the aim of conducting this research, namely aimed at runners who were active in taking part in competitions aged 30 to 45 years from 10 running communities in Balikpapan. As explained by Arikunto (2013) [3], purposive sampling is carried out by taking subjects not based on strata, random or area but based on the existence of a certain objective. Data analysis techniques are calculated using averages, percentages and calculations using t-test sampling to see the success of training methods on physical aspects. The physical aspect that will be tested is endurance.

This research was conducted using The One group Pre-test and Post-test design (Arikunto, 2013) [3]. In research design there are steps that will show the sequence of research activities, namely initial test (O1), treatment (X), and final test (O_2). The difference between the initial test and the final test (gain) will later be used as an assumption as the effect of the treatment.

The research instrument that the author uses is an achievement test. According to Arikunto (2013) [3], an achievement test is a test used to measure a person's achievement after learning something. The type of instrument used is the 101 Performance Evaluation Test. According to Brian Mackanzie (2005) [5]. In doing so all tests should therefore be specific (designed to assess an athlete's fitness for the activity in question), valid (test what they are intended to test), reliable (capable of consistent repetition) and objective (produce a consistent irrespective result of the tester). The instrument that the author took in the 101 Performance Evaluation Test was the 15 minute Balke Vo2max Test to measure endurance ability (Vo_2max). The 15 minute running test instrument (balke test) has a reliability of 0.99 and 0.92 with a validity coefficient of 0.98 and 0.85.

2.1 Subheadings

This research was conducted using The Pre-test and Post-Test without Control design (Henny *et al*. 2021) [10]. In the research design there are steps that show the sequence of research, namely all respondents receive treatment/ intervention (R), Pre-test before treatment (O1), Trial/intervention according to protocol (X), Post-test after treatment (O2). The difference between the initial test and the final test will later be assumed to be the effect of the treatment. The research design can be seen in table 2.1.

Table 1: Research design the pre-test and post-test without control

Respondent	Pretest	Treatment	Posttest
R	O_1	X	O_2

(Henny *et al*. 2021, 129) [10]

Information
R= All respondents received treatment/intervention.
(O1) = Pre test before treatment.
(X)= Trial/intervention according to protocol.
(O2) = Post test after treatment.

From the design stated above, the test is carried out once (O1) as an initial test and after treatment (O2) as a final test.

a) The population referred to by the researchers is runners in the Balikpapan area.
b) To facilitate the research, the researchers took active runners/runners from several Balikpapan running communities in the age category of 30 years and over.
c) The initial test uses an achievement test, namely the balke test, to determine the ability of Balikpapan runners before being given treatment.
d) After obtaining the initial test results data, the runners carry out the online training program that has been prepared.
e) After the data is obtained from the initial and final tests, it is then calculated and analyzed based on independent sample test calculations.

3. Results

The author concludes with data and graphic diagrams such as tables, so that with this description the researcher can analyze

the results of this research. The calculations in this research were designed for training program planning and training program testing techniques assisted by using the Microsoft Office Excel 2019 application. The average graph of the initial and final tests can be seen in the image referred to by the researcher.

Table 1: Average initial test score for Balikpapan runners

No	Name	Age	Preliminary Test Data			
			M/F	15 minute	Vo2max	Bench (100%)
1	Ida	43	F	2190	35,5	65%
2	Neyta	40	F	2190	35,5	65%
3	Kiki	42	F	2280	36,6	66%
4	Betty	39	F	2620	40,5	74%
5	Neli	32	F	2500	39,1	71%
6	Mela	32	F	2720	41,6	76%
7	Dodi	42	M	2790	42,4	71%
8	Iqbal	31	M	3190	47,0	78%
9	Nazmi	31	M	2760	42,1	70%

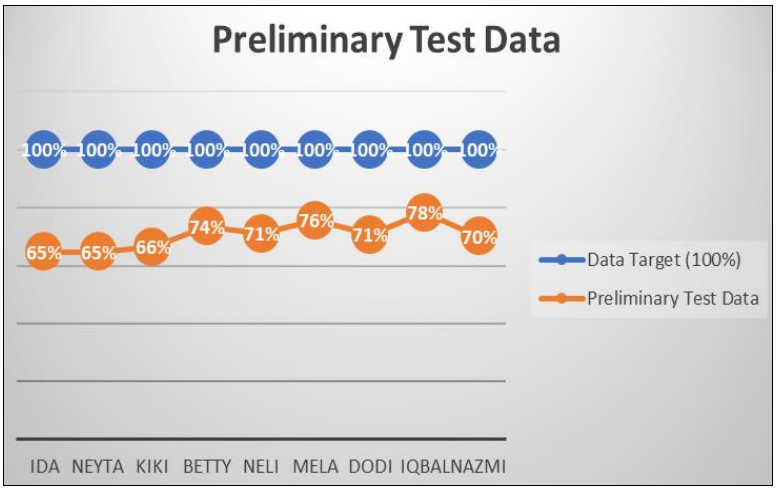

Fig 1: Initial data chart

Table 2: Average final test score for balikpapan runners

No	Name	Age	Final test data			
			M/F	15 minute	Vo2max	Bench (100%)
1	Ida	43	F	2400	37,9	69%
2	Neyta	40	F	2390	37,8	69%
3	Kiki	42	F	2900	43,7	79%
4	Betty	39	F	2800	42,5	77%
5	Neli	32	F	2950	44,3	80%
6	Mela	32	F	3370	49,1	89%
7	Dodi	42	M	3270	47,9	80%
8	Iqbal	31	M	3190	47,0	78%
9	Nazmi	31	M	2940	44,1	74%

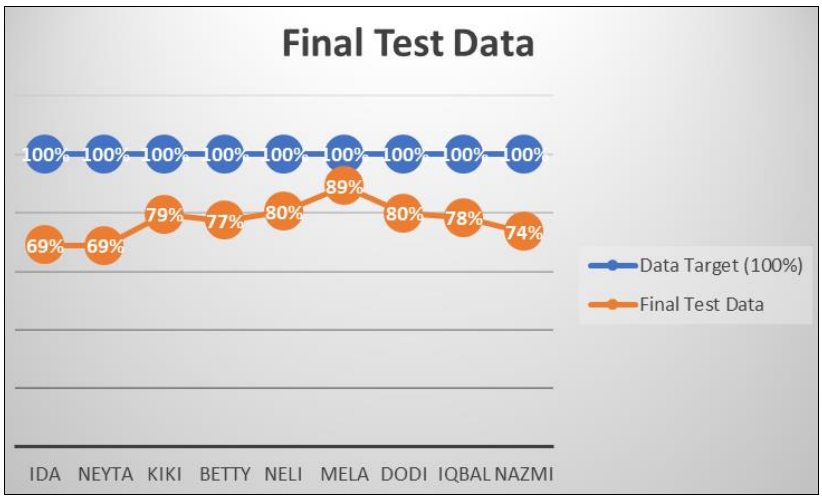

Fig 2: Final data chart

The results of the research showed that the sample gave satisfactory results, the researchers analyzed it in a structured and systematic manner during the treatment with the average before being given the treatment being 71% and after being given the treatment it was 77%, this is also stated in the initial and final data group graphs.

After processing the realized data with tables and graphs, the author then processed the scientific data using paired sample tests and the processing was carried out using the help of the IBM SPSS Statistics 22 application. The test results can be seen in table 3.

Table 3: Average difference in preliminary and final test scores domain intensity in online programs to increase vo2max

Paired samples test									
		Paired differences					T	df	Sig. (2-tailed)
		Mean	Std. deviation	Std. error mean	95% Confidence Interval of the difference				
					Lower	Upper			
Pair 1	Pre Test - Post test	-6.55556	4.61278	1.53759	-10.10126	-3.00986	-4.264	8	.003

The basis for the author's decision is if the Sig value. (2-tailed) < 0.05 then there is a significant difference and vice versa if the Sig. (2-tailed) > 0.05 so there is no significant difference. It is known that the Sig value. (2-tailed) is 0.003 < 0.05, so the author can conclude that there is a real difference between providing online programs and increasing Vo2max for Balikpapan runners. Thus, the author concludes that there is a significant influence of providing online training programs on increasing Vo2max for Balikpapan runners.

4. Discussion

In this research, there were several things that became obstacles or barriers during the training process. Because, online training programs focus more on the emphasis and realization of a runner in carrying out training. Therefore, the awareness of runners in the city of Baikpapan has an important role in carrying out the online training program provided, because without certain motivation and intention runners will have difficulty achieving maximum training results. According to Singgih, *et al*. in Karel (2015) [14]. Sports motivation is the overall driving force (motives) within an individual that gives rise to sports activities, ensures the continuity of training and gives direction to training activities to achieve the desired goals. So a runner must have motivation and encouragement in carrying out training, so that the goal of the training is achieved.

Raihan (2021) [20] said that research shows that the motivation level of female Electro Temanggung futsal players in practicing offline is in the (medium) category with a percentage of 50% and online is in the (low) category with a percentage of 50%. Apart from motivation, by understanding and knowing the correct training process according to online training recommendations, runners indirectly gain good health, fitness and well-being. This is in line with what Baole *et al*. (2022) [4]. This study revealed the mechanisms of physical activity and internet use on subjective well-being and that life satisfaction and the social mindset of youth are essential factors influencing subjective well-being. Hyeyoung *et al*. (2014). These results suggest that a Virtual Reality Exercise Program improves physical fitness, body composition, and fatigue in Hemodialysis patients.

Obstacles and constraints other than motivation for runners include providing training program treatment, online trainers do not know the immediate physical condition of runners after carrying out training activities, online trainers do not know whether runners enter the Training Zone or not, because there is no direct monitoring in the field, online trainers cannot know the climate/weather where the runner trains, and the online trainer can only evaluate the training report data via SmartWacth.

Meanwhile, the advantages of being given online training program treatment are that the online trainer can provide education, motivation and evaluation regarding the online training program anytime and anywhere, the online trainer can control the runner by providing a report that the runner has finished carrying out the training program using the smartwatch application, by Providing data via the online trainer's smartwatch application can provide predicted evaluations of the results of the training that has been carried out, and the online trainer can find out whether the runner is carrying out the training program or not by reporting training sessions or daily with the online application.

Casterline (2021) [15] this shows that more participants improved in these areas than participants with set goals to improve in these areas our findings suggest a positive effect of exercise training on physical function over time, regardless of how delivered. Online exercise training was found to be feasible and acceptable, making it a viable alternative to conventional exercise programs for older adults. Kikuchi *et al*. (2023) Our results suggest that online low-load resistance training improves fitness parameters and curbs depressive status. John *et al*. (2024) The study concludes that virtual-based exercise programs are as effective as traditional ones. Offering a virtual exercise option provides flexibility, potentially increasing adherence to exercise routines among corporate workers. Remote online training proved its effectiveness over a short period of time. We find that fitness challenges are helpful in increasing both a creator's performance and a follower's exercise activity. We found that fitness challenges significantly increase multiple metrics for channel performance, such as daily views, engagements, new followers, and views per follower. The studies in this review provide a convincing rationale for the use of online interventions to support Children and Young People's engagement with physical activity, due to the positive effects on physical and affective outcomes.

With the advantages and disadvantages of providing online training program treatment, to some extent it can be a solution for practicing even without being accompanied by a trainer. As with the explanation above regarding motivation, remote control between the runner and the coach must still be maintained, because with control the coach can evaluate the runner's shortcomings and consistency in training online with unlimited time. Because without reporting control, how can a trainer evaluate the results of his training even though it is online.

Anas (2022) [2] said that evaluation in training is an important component for measuring how well a training activity is implemented. Therefore, online programs and program evaluation are all interconnected. Whatever the training and training program provided, program evaluation is very important to help improve training performance, including training control, because training control is also the main determinant in evaluating a runner's performance.

5. Conclusion

The author concludes that the results of this research regarding the Effectiveness of Online Programs in increasing Balikpapan Runner Vo_2max in Recreational Sports have a significant influence. An important note that must be known is that online training programs must still be under the supervision of the controlling trainer even though the supervision is long distance, and the emphasis on runners in providing reports on the results of the implementation of the training program via their respective smartwatch applications must be recorded and recorded for the purpose of evaluating the trainer in viewing training performance. So that by controlling and evaluating the trainer can provide direction, discussion and suggestions via online media so that runners can be given motivation to be more enthusiastic and focused in carrying out training.

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