FITNESS, PERFORMANCE AND HEALTH JOURNAL
2024; 3(1): 6-13
Published online 03 01 2024 (https://todoxpublisher.com/index.php/fphj/index)
doi: https://doi.org/10.53797/fphj.v3i1.2.2024
e-ISSN 2821-3785

Effect of 6-Weeks Calisthenic Training on Physical Fitness: A Case Study Report

Febbie Reenaviviony Tony[1], Muhammad Nukman Harith Rosly[1], Nurnatasha Mustaza[1], Muhammad Haikal Shukry[1], Julie Jaequelyne Zefanya[1], Mohd Hafizuddin Baki[1], Mohd Huzairi Mohd Sani[1], Ebby Waqqash Mohamad Chan[1*]

[1]Faculty of Sport Science and Coaching, Sultan Idris Education University, 35900 Tanjong Malim, Malaysia.
*Corresponding author: ebby@fsskj.upsi.edu.my

To Cite This Article: Reenaviviony Tony, F., Nukman Harith Rosly, M., Mustaza, N., Haikal Shukry, M., Jaequelyne Zefanya, J., Baki, M. H. ., Mohd Sani, M. H. ., & Waqqash Mohamad Chan, E. (2024). Effect of 6-Weeks Calisthenic Training on Physical Fitness: A Case Study Report. *Fitness, Performance and Health Journal*, *3*(1), 6–13. https://doi.org/10.53797/fphj.v3i1.2.2024

ABSTRACT This study investigates the impact of a 6-week calisthenics training program on the physical fitness of a 21-year-old male student with prior calisthenics experience. Utilizing a prospective case study design, the subject underwent structured training sessions three to four days per week, progressively increasing in intensity over the study period. Baseline and post-training assessments encompassed body measurements, muscular endurance, and strength. Descriptive analysis revealed significant improvements in body metrics, including weight, height, waist circumference, hip circumference, body mass index (BMI), and waist-to-hip ratio. Additionally, muscle endurance, evaluated through 1-minute push-ups and sit-ups, exhibited substantial enhancements post-training. Despite a minor injury to the right hand, muscle strength, assessed using a hand grip dynamometer, showed overall improvement, particularly in the left hand. Comparisons with related studies support the efficacy of calisthenics in enhancing physical fitness, even among non-athletes. The findings underscore the feasibility and effectiveness of calisthenics as a practical training method for improving muscle endurance, strength, and body composition. Despite limitations associated with a single-subject design and the subject's prior experience, the study provides valuable insights into the potential benefits of calisthenics training.

Keywords: Calisthenics, Physical fitness, Muscle endurance, Muscle strength, Body composition

1. INTRODUCTION

Calisthenics training is also known as bodyweight training because it uses our own weight as the main essential tool for doing its training. According to Thomas, the term “calisthenics” was used to describe a broad range of exercises using just body weight. Improved body mass index, increased muscle strength, and improved balance are all advantages of calisthenics training. Because of this, calisthenics is a fantastic kind of exercise for increasing our self-esteem and ensuring that our health is in good shape.

Thomas, E. et al. (2017) claim that calisthenics is a practical and efficient training method for enhancing posture, strength, and body composition without the need of expensive training apparatus. Without the use of additional weight or equipment, calisthenics involves executing a range of exercises including push-ups, pull-ups, squats and planks. According to Ikpah, R. P. et al. (2022) calisthenics training is a cheap, feasible and effective training solution to improve posture and strength without the use of any major equipment. This indicates that calisthenics is a solid recommendation for someone who is still unsure of their ideal training regimen.

https://todoxpublisher.com/index.php/fphj/index / All right reserved

In this research, we were reporting a case about the effect of 6-week calisthenics training on the physical fitness of a subject through the training that we have been programmed for him. Our main purpose in this study is to test the effectiveness of calisthenics on muscle endurance in subjects who are ordinary people and not athletes. With this study, we will prove whether calisthenics training is effective or not on muscular endurance and other. components (body measurement, and muscular strength) within only a six-week period of time.

The report will explain about the subject's progress along with the designated training period. The training program and any physical parameter changes will be covered in depth. This will also be described, along with the supposed physiological advancements in question. As a result, discussion will be provided.

Table 1 The Calisthenics Training Program's schedule for a week

	Day 1			**Day 2**			**Day 3**			**Day 4**		
	Exercise	Reps	Sets	Exercise	Reps	Sets	Exercise	Reps	Sets	Exercise	Reps	Sets
Warm up	Warm up 5 minutes			Warm up 5 minutes			Warm up 5 minutes			Warm up 5 minutes		
Training	Hindu push-up	15	3	Inch worm	15	3	Floor IYT raises	15	3	Incline push-up	15	3
	Beach dips	15	3	Drop squat	15	3	Single leg ham bridge	15	3	Standard push-up	15	3
	Triangle/ diamond push-up	15	3	Shoulder taps	15	3	Superman pull	15	3	Glute kickback	15	3
* 10 min rest each set break	Lateral lunges	15	3	Standing calf raise	15	3	Plank	15	3	Kneeling pike push-up	15	3
	Shoulder taps	15	3	Superman pull	15	3	Glute kickback	15	3	Calf rise	15	3
Cool down	Cooling down 5 minutes			Cooling down 5 minutes			Cooling down 5 minutes			Cooling down 5 minutes		

2. METHODS

The case subject, a 21-year-old male student, embarked on a calisthenics training program with the intention of enhancing his physical fitness and transforming his physique, particularly in terms of increasing his muscular endurance. Before we chose him as our subject, he had experience with calisthenics and was conversant with calisthenics training because he had been doing it on his own. We designed his instruction for the general population or broad public. For this case report we use a prospective method. The researcher follows up the progress of the subject's calisthenic program plan.

The experiment's subject is required to complete a calisthenics training plan for three or four days per week in six weeks. Week by week, the exercise training's intensity will increase. In the first and second week at an intensity of three sets of fifteen repetitions with ten minutes of rest between sets. The third week every training exercise will be given four sets of twenty reps while the fourth week is given four sets of twenty-five reps followed by the fifth and six week, four sets of thirty reps with ten minutes rest in each set break. After each session, the subject will be given a day to rest. Every day's training sessions will take place in the evening. Before the subject begins the training, the subject will warm up and cool down after the training is finished. Table 1 shows the details of the Calisthenic Training's schedule for a week.

3. RESULTS

For participant information, researchers provide detailed descriptive demographic information about the subject including age, sex, education, nationality, ethnicity and religion. By the background of the subject, the calisthenic workout plan starts from the intermediate level and the purpose is to have enhancement for the advanced plan. The results represented descriptive analysis by line chart and difference between pre and post.

Table 2 Descriptive demographic information

Age	21 years old
Sex	Male
Education	Bachelor's degree in ISM Sport Science (Sport Rehabilitation)
Nationality	Malaysian
Ethnicity	Malay
Religion	Islam

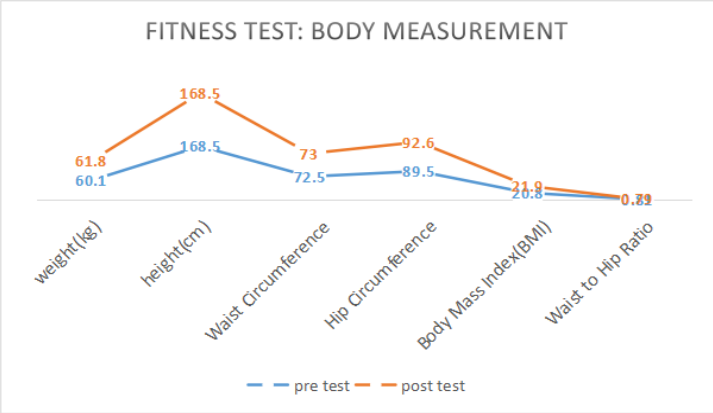


Fig. 1 Line chart of fitness test for body measurement. A significant improvement between pre-test and post-test.

Based on the baseline measures that are summarized (fig. 1). The line charts showed a significant improvement of line by body measurements that include weight, height, waist circumference, hip circumference, body mass index and waist-to-hip ratio between pre-test and post-test fitness test measures. No differences were shown to weight between pre and post-measures (168.5 cm vs 168.5 cm) but differences to other measurement (weight: 1.7 cm, waist circumference: 0.5 cm, hip circumference: 3.1 cm, BMI: 1.1(kg/m²), waist to hip ratio:0.02) resulting in increase of the participant to progress by calisthenic program.

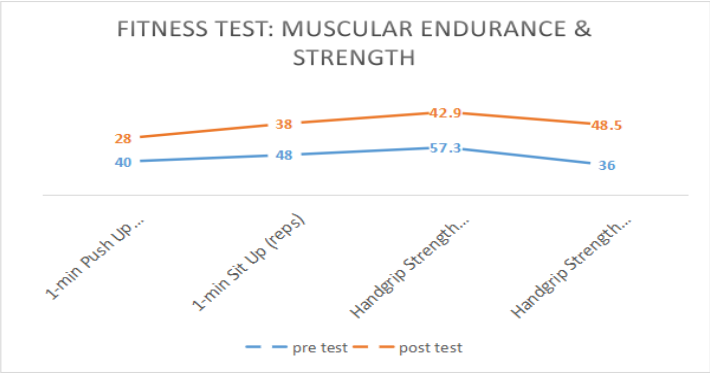


Fig. 2 Line chart of fitness test for muscular endurance and strength. A significant improvement between pre-test and post-test.
(R) refers to the right hand while (L) refers to the left hand.

Based on muscular endurance and strength, the chart shows improvement on 1-minute push-ups (28 reps vs 40 reps, difference by 12 reps) and 1-minute sit-up (38 reps vs 48 reps, difference by 10 reps). There is a decrease and increase for the handgrip chart between pre and post (handgrip strength test (R): 57.3 kg vs 42.9 kg, handgrip strength test (L): 36kg vs 48.5 kg) that improve for the left hand.

4. DISCUSSIONS

In the context of targeting muscle endurance, a pre-test refers to an assessment conducted before beginning a training program to improve muscle endurance. The objective of the pre-test is to determine an individual's current level of muscle endurance, identify areas of weakness, and establish a baseline against which progress can be measured. In our case study we found a research article that states during the pretraining and post-training fitness assessment sessions, each subject underwent a series of tests to determine baseline and final measurements. Baseline measurements were conducted during the pre-training fitness assessment session at least 48 hours before the first training session. Final measurements were conducted 48 hours after the last training session during the post-training fitness assessment session. This study is closely related to our study and has been written by Kotarsky. et. al (2018).

Our group does a pre-fitness test to test our athlete's muscle endurance. For example, we do body measurements, muscular endurance, and muscular strength. For body measurement, we measure height, weight, waist, and hip. For muscular endurance, we do a 1-minute push-up and 1-minute sit-up. For muscular strength, we do a handgrip strength test.

Pre-fitness tests are an essential part of assessing an athlete's physical capabilities and determining their baseline fitness levels. These tests help in identifying strengths and weaknesses, tracking progress, and designing appropriate training programs. In our group's pre-fitness test, several parameters are measured, including body measurements, muscular endurance, and muscular strength. Here's a detailed explanation of each component:

First, the body measurement of our subject in the pre-test, the subject Weight (kg) 60.1s, Height (m) was 168.5, waist circumference (cm) was 72.5, hip circumference (cm) was 89.5, BMI was 20.8, and waist to hip ratio 0.81. From this data we have given the subject the workout planning for the 20^{th} week and after that, we test and calculate the body measurement of our subject again in the post-test. The result is a weight (kg) of 61.80, Height (m) of 168.5, waist circumference (cm) of 73, hip circumference (cm) of 92.6, BMI of 21.9, and a waist-to-hip ratio of 0.79. From this data, we can see that our subject is gaining more weight in body mass after finishing our workout program. It is because the subject is gaining more muscle mass and losing fat in his body overall, we can see it from the result of muscle endurance and muscle strength.

For muscle endurance we take 2 exercises which are 1- min push up (reps) and 1-min sit up (reps). In the pre-test, the subject can do 40 reps for a 1-min push-up and 28 reps for a 1-min sit-up. After the 20^{th} week of our workout program, we do a post-test and the result for 1-min push up (reps) is 48 and 1-min sit-up (reps) is 38. This result shows that our workout program is effective for the subject to increase his muscle endurance and the subject can do the test much more efficiently and easier with a correct body position while doing the exercise. Compared to the study by E. Marcinik et al. aerobic/ circuit weight training program produced significantly greater dynamic muscular and muscular endurance changes than the standard aerobic/ calisthenics program. However, that study is participated by a Navy man, so, for ordinary people and non-athletes it is enough to do calisthenics to improve muscle endurance.

Next is the test for muscle strength. We test our subject muscle strength using a hand grip dynamometer test for both hands. The pre-test result shown on the right hand was 57.3kg and the left hand was 36.0kg and in the post-test, the right hand is 48.5kg and the left hand is 42.9kg. We can see at right-hand results are decreased, when we examine and asked the subject we got the answer that our subject has pain in his right hand because of the last session or last week of our workout plan on a high-intensity level, and his right hand having some pain around his wrist

but the injured are not too serious it just a small sprain around his right wrist. Meanwhile, the left-hand shows good results by increasing in strength by about 6.9kg. It shows that overall strength is increased if the subject does not have any injury. Even though our subject has an injury, calisthenics is actually effective in improving muscle strength. According to Emily Mear et al. calisthenics may be effective at increasing muscle strength. According to C. Kotarsky et al. also calisthenics can improve upper-body muscle strength by using different progressive variations to maintain strength training programming variables. So, this proves the statement above is true.

5. CONCLUSIONS

The sole individual evaluated makes it impossible to determine if this training is effective for the broader population, which is one of the study's drawbacks. Additionally, our subject trained in calisthenics before we gave him a program, so we are unable to fully see how someone who is inexperienced with this training differs. This implies that even if a newbie achieved it, we can't really tell how difficult it was for them. On the other hand, because we lack the necessary equipment to assess muscular strength on our own, the pre- and post-test phases for this parameter are different

The biggest benefit of the research was that we could concentrate on our subject because, in this situation, he was the sole subject. So that we may closely watch him while he completes the training program. This circumstance gives us the opportunity to immediately rectify his incorrect body position. As a result, the possibility of harm can be eliminated. The second advantage is that our subject already understands how to perform calisthenics correctly since he is familiar with them. Additionally, he is aware of the muscles that the exercise program concentrates on. As a consequence, when we test him again later, the outcome will be accurate. Lastly, because the training is calisthenics which uses body weight as its main equipment, we can do it anywhere as long as our subject is comfortable. Thus, the training is smoothly conducted.

All things considered, we can say that we have succeeded in achieving our major goal, which was to demonstrate that this training program may enhance muscle strength, body mass index, and endurance in those who are not athletes like our subject. Callisthenics is a simple and portable form of exercise or training that requires no or very little equipment. Callisthenics is a beneficial exercise for improving strength-endurance, postural stability, and has a good impact on body composition by considerably lowering body fat mass. Therefore, this training program was suggested to anyone who was still looking for fitness advice. Last but not least, we hope that our research will serve as a resource for future researchers.

REFERENCE

Ikpah, R. P. (2022). The effect of four weeks' strength and flexibility training on calisthenics beginners.

Kaliyadan, F., & Kulkarni, V. (2019). Types of variables, descriptive statistics, and sample size. Indian Dermatol Online J, 10, 82-86.

Kimura, T., Okamura, T., Iwai, K., Hashimoto, Y., Senmaru, T., Ushigome, E., ... Fukui, M. (2020). Japanese radio calisthenics prevents the reduction of skeletal muscle mass volume in people with type 2 diabetes. BMJ Open Diabetes Research & Care. https://doi.org/10.1136/bmjdrc-2019-001027.

Kotarsky, C., Christensen, B., Miller, J., & Hackney, K. (2017). Effect of Progressive Calisthenic Push-up Training on Muscle Strength and Thickness. Journal of Strength and Conditioning Research. https://doi.org/10.1519/JSC.0000000000002345.

Marcinik, E., Hodgdon, J., Mittleman, K., & O'brien, J. (1985). Aerobic/calisthenic and aerobic/circuit weight training programs for Navy men: a comparative study. Medicine and Science in Sports and Exercise. https://doi.org/10.1249/00005768-198508000-00014.

Marwat, N. M., Aslam, H., Hussain, A., Hassan, H., Asghar, E., Zafar, A., & Ullah, H. (2021). Calisthenics training: effects on physical fitness (coordination, flexibility and endurance) of kabaddi players. PalArch's Journal of Archaeology of Egypt/Egyptology, 18(1), 5212-5220.

Mear, E., Gladwell, V., & Pethick, J. (2022). The effect of breaking up sedentary time with calisthenics on neuromuscular function: a preliminary study. bioRxiv. https://doi.org/10.1101/2022.06.22.497167.

Thomas, E., Bianco, A., Mancuso, E. P., Patti, A., Tabacchi, G., Paoli, A., ... Palma, A. (2017). The effects of a calisthenics training intervention on posture, strength and body composition. Isokinetics and Exercise Science, 25(3), 215-222.

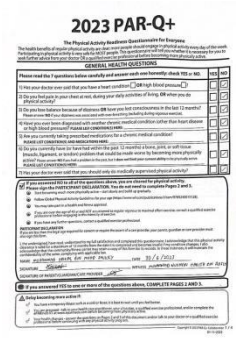
Thomas, E., Bianco, A., Patti, A., Bellafiore, M., Battaglia, G., Paoli, A., & Palma, A. (2016). Physical characteristics of moderately active men after 8 weeks of ‘‘calisthenics’’training. Sport Sciences for Health, 12, 84.

Tsourlou, T., Gerodimos, V., Kellis, E., Stavropoulos, N., & Kellis, S. (2003). The Effects of a Calisthenics and a Light Strength Training Program on Lower Limb Muscle Strength and Body Composition in Mature Women. Journal of Strength and Conditioning Research. https://doi.org/10.1519/1533-4287(2003)017<0590:TEOACA>2.0.CO;2.

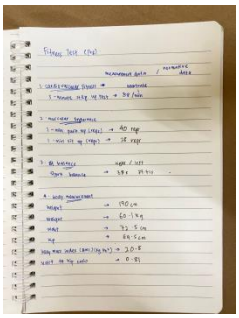
Wei, Z. (2009). Research of the Effect on Calisthenics for Physique and Mental Health of Female College Students. Journal of Gansu Lianhe University.

ATTACHMENT

Form PAR-Q+



Pre test



Pre-test results

Measuring WHR

Intervention

Glute kickback

Incline push up

standard push up

kneeling pike push up

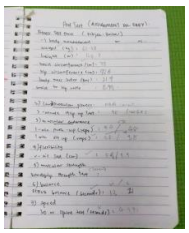
calf rise

Post

1-min Push-up

measuring strength

1-min Sit-up



Post-test results