

Athletic Calisthenics: Strengthening the Athletic Ability of Football Male Student-Athlete Through Push-ups and Squats

Racelyn C. Israel, John E. Bailey, Angel Grace S. Cerna, Dhianacel S. Repizo, Althea T. Arguilles, Louie P. Gula*

Institute of Human Kinetics, Visayas State University, Hilagang Leyte, Philippines

ABSTRACT

This study explores whether adding push-ups and squats to workout routines can improve the athletic prowess of football players at Baybay National High School (BNHS). A research design that resembles an experimental study is called a quasi-experimental. Students in the Special Program in Sports (SPS) at BNHS, which is only for Baybay Football Club students, make up the participants in this study. Based on the participants' grade levels, which ranged from 7 to 10, groups were created. The researchers will watch and record only those who complete the repetition after they have completed push-ups and squats. From day 1 to day 5, the participants gradually increase their athletic ability to analyze the data. Finally, incorporating push-ups and squats into the training regimen of football men players can significantly improve their athletic ability. The significant gains in strength, power, endurance, and agility observed highlight the potential of these exercises as integral components of a well-rounded training program.

Keywords: Calisthenics, Athletic ability, Strengthening, Push-ups, Squat.

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INTRODUCTION

Calisthenics, which also goes by bodyweight training and strength training, refers to movements you can do with your body weight, such as push-ups, squats, sit-ups, and curl-ups. It is a form of exercise that employs just one's body weight as resistance and is designed to enhance one's body's stamina, strength, and flexibility. Following prescribed training activities it will enhance a person's physical characteristics, coordination, upper- and lower-body extremity range of motion, and muscle endurance capacity, making it an efficient physical activity for improvement. Calisthenics are exercises that do not require external weight or resistance. The challenge will be created by exercising against gravity and your body weight.

Basic calisthenics include squats, push-ups, lunges, dips, jumping jacks, sit-ups, pull-ups, and crunches. Jumping lunges, single-legged squats, and power push-ups are examples of more advanced calisthenics. Pay attention to your form while performing calisthenics; maintaining proper form and posture throughout the exercises is far more critical than completing specific repetitions or sets. Maintain a soft bend in your elbows and knees throughout the activities; locking either joint can result in injury.

Gist *et al.* claimed that even with short-term, low-intensity training, calisthenics training is efficient for maintaining fitness. Retaining fitness for people who trained moderately through high-intensity workouts or by following a thorough program would be ideal. According to American College of Sports Medicine surveys, calisthenics were the top fitness trend in 2017 and 2016, and they were the top activity in 2015. It has been demonstrated by professional athletes that some sports, including bodybuilding, kabaddi, and soccer, demand endurance.

Resistance training is a fundamental type of exercise because it fosters the development of various neuromuscular and musculoskeletal qualities, such as muscular strength, muscular endurance, and muscular power (Asadi A, *et al.*, 2016). Regular exercise is crucial for athletes because it maintains and enhances physical fitness. Resistance training can be performed in a variety of

Corresponding Author: Louie P. Gula, Institute of Human Kinetics, Visayas State University, Hilagang Leyte, Philippines, e-mail: louie.gula@vsu.edu.ph

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ways. Dumbbells and traditional free weights are the most popular, although weight machines, calisthenics (using one's body weight), elastic tubing, and medicine balls can all be used.

In Park's opinion, organizing the manipulation of volume and intensity is the most efficient way to accomplish long-term advancement in resistance training. Resistance training variables, such as the external resistance utilized, the number of sets and repetitions per exercise, the duration of the rest period, and the frequency of the activity, are all manipulated by a trainer to promote exercise progression.

Calisthenics

Exercises called calisthenics use your body weight to accomplish various activities without any instrument or equipment. It aims to increase body flexibility and strength by swinging, bending, jumping, kicking, or stretching. It employs just one's body weight as resistance, and it also works to improve both cardiovascular and musculoskeletal fitness in everyone who practices calisthenics. Without equipment, we can continue advancing our physical and well-being goals through regular exercise.

Callisthenic exercise is an essential component of obesity treatment. There is little information available about the best and safest type and volume-intensity of physical exercise to be prescribed for morbidly obese individuals. Calisthenics also aids flexibility development by incorporating movements that fully

extend the body. They improve your body's strength, endurance, coordination, and flexibility while giving you the ripped look many people desire. Consider exercises like push-ups, pull-ups, dips, and squats. People often need to be aware of how many different exercises are available to train their bodies.

Different gymnastic movements, bouncing exercises, push-ups, shuttles, pull-ups, lunges, planks, squats, step-ups, crunches, dips, ply-jacks, burpees, and mountain climbers are just a few examples of the various variants (Srivastava, 2016).

Football

The most popular sport in the world is Football, also known as "soccer," in some regions. The players in this outdoor game must constantly hustle and sprint across the field while carrying the ball, which calls for extreme athleticism. Changes in direction, jumping, and running—all physically taxing, high-intensity actions—were crucial for young players' competitive success and adults in this intermittent activity. The five components of health-related fitness (body composition, cardiorespiratory fitness, muscular strength, endurance, and flexibility) and sport-specific traits like speed and response time are all examples of physiological parameters.

The five components of health-related fitness (body composition, cardiorespiratory fitness, muscular strength, endurance, and flexibility) and sport-specific traits like speed and response time are all examples of physiological parameters. According to Nikolaidis (2010), maintaining a player's weight is essential for Football and requires them to perform calisthenics workouts.

Also, based on Mayorga-Vega *et al.* (2015), it was said that a strength training program should incorporate multiple-set training, the appropriate number of repetitions, longer rest intervals (three to five minutes), and multiple-set training.

Push-ups

Pushing exercises are a staple of strength training programs, and their movement mimics daily activities. The bench press is a joint pushing exercise for strengthening the upper body. Traditional push-ups strengthen the upper body as an alternative to conventional weight-lifting exercises. Push-ups have also been used in testing and the rehabilitation of upper-extremity injuries. Push-ups are a popular exercise because they can be modified to increase intensity. Push-up progressions may include exercising with more resistance or in unstable conditions.

Increased upper extremity muscle strength and hypertrophy are the goals of the push-up exercise. This is excellent for defining the triceps, shoulders, and torso in addition to the chest. It will increase upper body physical endurance, fortify bones and muscles, and build lean muscle mass that boosts metabolism. The Pectoralis major, deltoid, and triceps are the three main muscles used in push-ups (Haff & Triplett, 2015; Youdas *et al.*, 2010).

This workout is well-liked since it can be completed without any additional equipment and because it can have different intensities. The upper body's muscular endurance can also be evaluated using push-ups (Fielitz, 2016; Mak *et al.*, 2010). When performing a push-up in the eccentric phase, the shoulder joint moves in two directions—extension and horizontal—while the shoulder girdle moves in three directions—adduction, downward rotation, and reduction of lateral tilt—all coordinated with elbow flexion.

The shoulder joint's action typically consists of flexion and horizontal flexion during the concentric phase, and the shoulder girdle's corresponding movements include abduction, upward rotation, and lateral tilt, which are accompanied by the motion of

elbow extension. The traditional push-up is a popular upper-body push pattern exercise that tests shoulder girdle mechanics under load, has a reasonably short learning curve, and is adaptable to load for both beginner and elite athletes.

Squats

One of the most contentious exercises in physical fitness or conditioning, particularly in the growth of muscular endurance, strength, and power of the legs, is the squat movement with or without weight. People who engage in squatting exercises should be aware of the common erroneous positions that arise in the feet, ankles, knees, hips, and spine to make the required corrections and protect themselves from avoidable injuries. Squats are possibly the most effective exercise for losing weight in the thighs, buttocks, and legs, toning the lower body, and increasing core strength without using weights. It tones the quadriceps, buttocks, thighs, and shins while strengthening the hamstrings and calves. By placing your arms behind your head, you can renovate regular squats and increase the strain of the exercise.

Results from a study on the effects of squat exercise on body composition and muscular strength showed that training in body mass-based squats for two months is a practical and efficient way to improve body composition, the power of the knee and hip extensor muscles, and jump performance in male adolescents (Takai, 2013). The study by Slegen (2013) noted that stretching activities with eccentric contractions are utilized to prevent chronic sports injuries and that traditional stretching exercises have acute effects in the prevention of sports injuries.

Much evidence supports its usage in enhancing physical endurance, strength, and power. There are numerous varieties, including bodyweight squatting, squatting on a barbell, squatting on a barbell's chest or neck, squatting with dumbbells, sumo squatting, and split squatting (2015) Soriano *et al.*

It is well known that the calisthenics workout routine works both the lower and upper limbs exceptionally well. Upper and lower extremity large muscle groups are engaged quickly, at a low intensity, and with adaptation, making it a practical and beneficial exercise.

Adolescent athletes should participate in well-rounded training regimens, according to strength and conditioning professionals. The strength and conditioning program must be properly periodized and progressed for any prospective college athlete's training. Periodization is a systematic approach to manipulating training volume, specificity, and intensity to achieve the best physiological outcome for the athlete.

RESEARCH METHODOLOGY

This study used a quasi-experimental research design to examine the athletic ability of Football players in performing push-ups and squats in training. This study included groups ranging from grade 7 to 10 levels of male students. In quasi-experimental designs, a comparison group is chosen that is as like the treatment group as possible in terms of baseline (pre-intervention) characteristics. The comparison group represents the outcomes that would have occurred if the program/policy had not been implemented. As a result, the program or policy is responsible for any differences in outcomes between the treatment and comparison groups (White *et al.*, 2014).

The study's respondents were Baybay National High School (BNHS) students on 30 de Diciembre. St. who took the Special Program in Sports (SPS), specifically in Football sports, from grade



7 to 10 level male students. Thirty players will be the participants in this study. This study used a stratified sampling method in collecting the data because the school of (BNHS) has regularly trained and focused on developing the skills in playing. The stratified sampling method divides into several subpopulations that are more homogeneous than the total population (differences between subpopulations are referred to as strata). A sample is created by selecting items from each stratum. Because each stratum is more homogeneous with the population, each stratum generates more precise estimates. (Etikan, et.al, 2017).

The research was conducted solely in the training area of the Baybay National High School soccer field. It will be held from July 22 to August 7, 2023, as part of their training schedule.

The researchers used a test instrument in this study, including a pre-test and post-test. A test is used in groups to determine an individual's skill, intelligence, and ability. To collect data from the respondents, the researchers specifically used an adaptation of an evaluation tool from Sutton's Sports Performance Testing and Evaluation. An evaluation tool comprised two calisthenics, push-ups, and squats, divided into grade levels. During the observation, they performed push-ups and squats and tracked how many repetitions they could do. This was done solely for the Baybay National High School football team to assess the student-athletes' capabilities.

RESULTS

PUSH-UPS

The mean response over time

The average number of push-up repetitions over time increases generally. The variation also increases from day 2 to 5. However, from day 1 to day 2, the variance decreased by a negligible amount. From day 1 to day 5, the average number of push-up repetitions increases by 15 counts. An increase in the mean number of push-up repetitions observed from day 1 to day 5 is a positive sign of strength progression for individuals. This improvement indicates that the participants could complete more repetitions on average, indicating that their training effectively strengthened their athletic ability (Table 1).

The mean response over time by grade level

The average number of push-up repetitions increases for all grade levels within the day. During the observation period, each grade level improved daily. Consistent progress across grade levels indicates that training or exercises foster growth and development for all student-athletes (Table 2).

Correlation plot

A positive (linear) correlation is observed for consecutive measurements. It means that the measurements increase from day 1 to day five, so they have a positive connection, and football

Table 1: The mean response over time

day	variable	n	mean	sd
1	NumRep	30	21.200	10.121
2	NumRep	30	24.467	9.730
3	NumRep	30	28.033	9.754
4	NumRep	30	32.000	10.729
5	NumRep	30	36.233	13.920

Table 2: The mean response over time by grade level

grade	day	variable	n	mean	sd
Eight	1	NumRep	7	16.286	2.812
Eight	2	NumRep	7	20.143	3.338
Eight	3	NumRep	7	23.286	2.430
Eight	4	NumRep	7	26.000	2.449
Eight	5	NumRep	7	26.857	3.185
Nine	1	NumRep	8	28.125	7.918
Nine	2	NumRep	8	30.750	7.106
Nine	3	NumRep	8	33.125	6.707
Nine	4	NumRep	8	35.625	6.567
Nine	5	NumRep	8	41.625	13.511
Seven	1	NumRep	7	11.857	4.525
Seven	2	NumRep	7	14.857	4.140
Seven	3	NumRep	7	18.714	3.352
Seven	4	NumRep	7	23.429	3.359
Seven	5	NumRep	7	26.286	5.707
Ten	1	NumRep	8	26.750	11.659
Ten	2	NumRep	8	30.375	11.019
Ten	3	NumRep	8	35.250	11.659
Ten	4	NumRep	8	41.125	14.116
Ten	5	NumRep	8	47.750	14.558

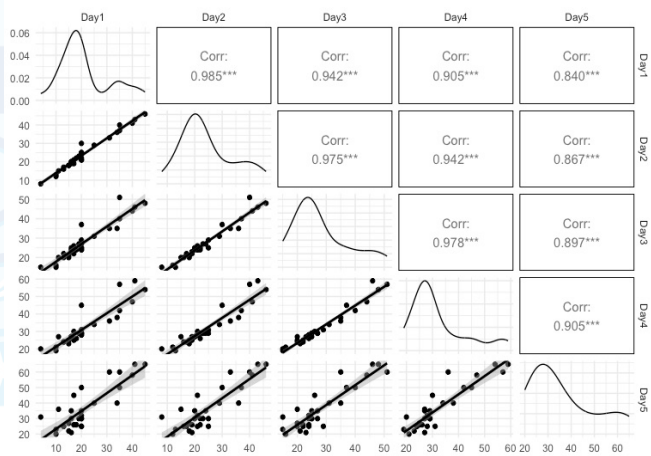


Figure 1: Correlation plot

male student-athlete is committed to improving their skills and strengthening their athletic ability, which allows them to develop muscular muscle strength, endurance, cardiovascular endurance, and flexibility in their abilities (Figure 1).

Individual plot

In general, measurements increase over the five days. Only a few students have fluctuating observations. It shows that most participants consistently increased their repetitions from day 1 to day 5, while only a few participants varied (Figure 2).

SQUATS

The mean response over time

Overall, the mean response increases with days. The variance of the number of squat repetitions also increases with days. From day 1 to day 5, the average number of squat repetitions rises by 52 counts. An increase in the average number of squat repetitions from day 1

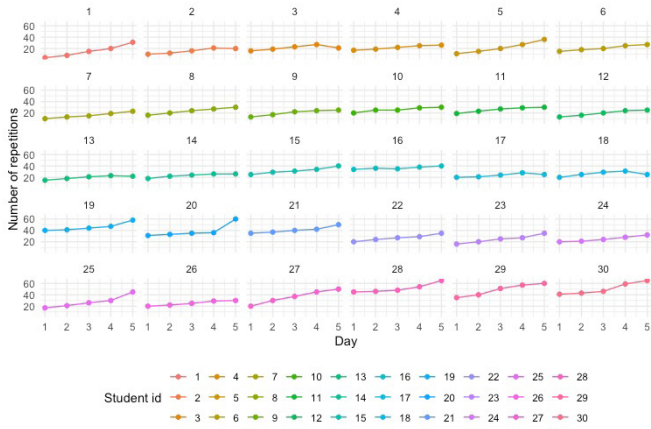


Figure 2: Individual plot

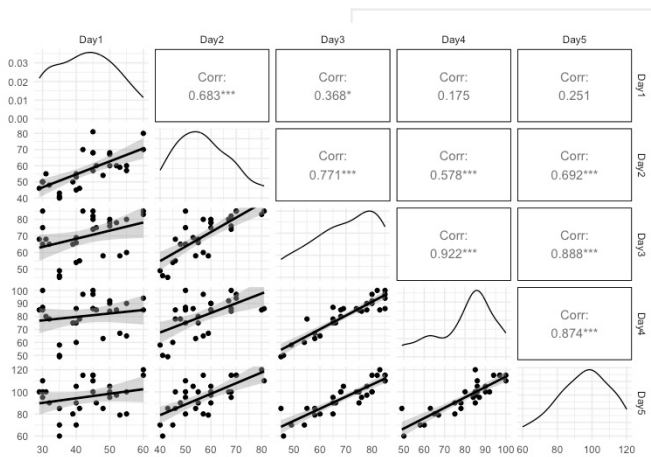


Figure 3: Correlational plot

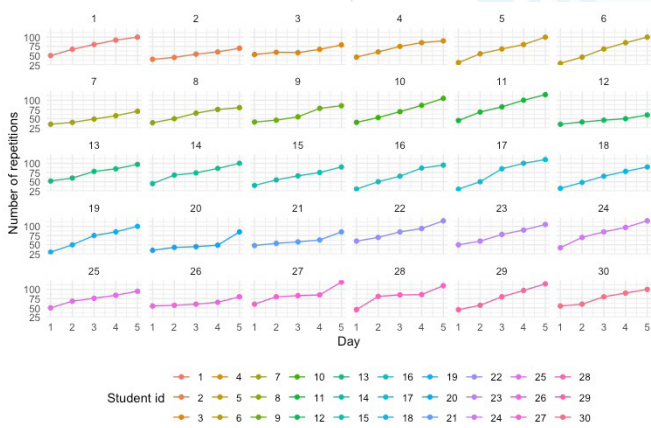


Figure 4: Individual plot

to day 5 of observation is helpful for student-athletes to advance in their strength. This improvement shows that the participants could complete, on average, more repetitions, indicating that their training program successfully enhanced their athletic ability (Table 3).

The mean response over time by grade

As we can see in Table 4, the average response increases over the five days among all the grade levels. It shows that male football student-athletes' performances have been steadily improving over time.

Table 3: The mean response over time

day	variable	n	mean	sd
1	NumRep	30	42.933	9.195
2	NumRep	30	57.033	10.801
3	NumRep	30	69.733	12.250
4	NumRep	30	80.400	14.016
5	NumRep	30	95.367	15.064

Table 4: The mean response over time by grade level

grade	day	variable	n	mean	sd
Eight	1	NumRep	7	42.429	5.473
	2	NumRep	7	55.143	10.558
	3	NumRep	7	67.000	12.832
	4	NumRep	7	80.000	15.416
	5	NumRep	7	91.714	18.273
Nine	1	NumRep	8	38.125	10.855
	2	NumRep	8	52.500	7.964
	3	NumRep	8	68.000	13.512
	4	NumRep	8	78.875	16.643
	5	NumRep	8	96.250	11.260
Seven	1	NumRep	7	40.571	9.396
	2	NumRep	7	53.143	9.720
	3	NumRep	7	64.571	11.312
	4	NumRep	7	75.286	13.487
	5	NumRep	7	87.000	13.892
Ten	1	NumRep	8	50.250	6.135
	2	NumRep	8	66.625	9.797
	3	NumRep	8	78.375	8.088
	4	NumRep	8	86.750	10.110
	5	NumRep	8	105.000	13.093

Correlation plot

A positive (linear) correlation is observed for consecutive measurements. It demonstrates the commitment of the male student-athletes who play Football to developing their abilities and enhancing their athleticism, which helps them develop skills like muscle strength, endurance, cardiovascular health, and flexibility (Figure 3).

Individual plot

In general, measurements increase over the five days. Only very few students have fluctuating observations. Similarly, most participants consistently increased their repetitions from day 1 to day 5, while only a few participants varied (Figure 4).

CONCLUSION

According to the study's findings, the average number of push-ups and squat repetitions increased for male football student-athletes, indicating a positive relationship between the two. It implies that their training programs improved their strength, training skills, and endurance throughout the study. As a result, push-ups and squats benefit student-athletes and should be included in their workout routine.

RECOMMENDATIONS

Football players must maintain consistency in their performance. Athletes should be aware of their strengths and weaknesses in training so that their coaches know them. Athletes should be aware



of any improvements to improve their performance even further in the future. Teenagers must be encouraged to participate in any exercise that will improve their lifestyles. To improve an athlete's strength, the attitudes themselves must be disciplined. Athletes are encouraged to participate in or collaborate with other outside activities to gain experience and socialize.

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