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ORIGINAL ARTICLE

Effects of an eight week training regimen with a novel bench press pad compared to a traditional bench on upper body strength and performance in collegiate American football players

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ABSTRACT

This study examined the efficacy of resistance training utilizing a novel bench press pad (BPAD) to improve performance in the one-repetition maximum (1-RM) bench press, the National Football League (NFL) 225-lb reps to-fatigue bench press test (NFL-225 Test), and a seated medicine ball throw (SMBT) following an 8-week, two-block periodized bench press training program. Thirty male collegiate football players with a history of moderate resistance training were randomized to one of two groups, each utilizing either a novel bench press pad or traditional flat bench (CONT). The participants exercised thrice weekly for eight weeks (totalling 24 sessions) while also participating in a simultaneous 8-week off-season training program. The bench press exercises were incorporated into the regular 1-hour sessions occurring three times per week and divided into two identical block periods, which differed only in the equipment used. The training session comprised three chest press exercises, upper and lower chest presses, as well as fly exercises, which enabled the application of different variations of external loads to the pectoral muscles. Both groups exhibited significant improvements in 1-RM BP, NFL-225 Test, and SMBT after 8 weeks (all $p < .001$), with the BPAD group demonstrating a significantly greater increase compared to the CONT group in all performance outcome measures (all $p < .001$). These results suggest that the use of a BPAD intervention may provide an additive effect to bench press training, which can elicit greater upper body strength, power and performance enhancements.
Keywords: Performance analysis, Bench press, Muscular strength, 1-RM, NFL test, SMBT, Ergogenic aid.

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INTRODUCTION

Speed, strength, and power are fundamental attributes that significantly impact performance outcomes across all positions in American football. Among these, upper-body strength is particularly critical, as it underlies the ability to engage in and resist physical contact, shed blocks, execute tackles, and maintain balance and control during high-impact plays (Robbins, 2010). Accordingly, the development of upper-body strength is a central focus of strength and conditioning programs designed for football athletes.

To evaluate these physical qualities, the National Football League (NFL) Scouting Combine includes a standardized 225-lb bench press test (NFL-225 Test), which serves as a key indicator of upper-body muscular endurance. In tandem with the one-repetition maximum bench press (1-RM BP), these tests have demonstrated moderate to strong correlations with on-field performance and overall athletic potential at the collegiate and professional levels (Mann et al., 2015). As such, maximizing the effectiveness of training interventions that enhance performance in these metrics is of great interest to both athletes and training staff.

The flat barbell bench press is one of the most commonly prescribed exercises for improving upper-body strength, power, and hypertrophy. It engages several major muscle groups including the pectoralis major, triceps brachii, anterior deltoids, biceps brachii, latissimus dorsi, and scapular stabilizers (Lauver et al., 2015; Król et al., 2010; Rodríguez-Ridao et al., 2020). Of these, the pectoralis major serves as the primary agonist during the pressing motion, making it a key target for training protocols aiming to enhance upper body pushing force. However, despite its widespread use, the traditional flat bench press may limit scapular movement and disrupt normal scapulohumeral rhythm, particularly by restricting scapular retraction. Limitation of scapular mobility is attributed to the fixation of the scapula against the bench, which can limit its movement and cause abnormal movement patterns that place the shoulder at an increased risk for injury (Noteboom et al., 2024). This can result in humeral hyperextension, potentially compromising lift mechanics and muscle activation efficiency (Noteboom et al., 2024). Additionally, there have been concerns that equipment manufacturers have insufficiently addressed considerations for proper set up and stabilization techniques in their bench designs. Peak power and force outputs while performing the bench press have been shown to decline during unstable bench-pressing conditions (Koshida et al., 2008).

In response to these concerns, equipment modifications have been introduced to improve bench press mechanics and reduce the risk of joint stress. One such device is the Launch Pad™ (Advanced Muscle Mechanics, Dallas, TX, USA), an ergonomically engineered bench press pad designed to enhance thoracic and lumbar spine support during pressing movements. Positioned beneath the scapula and thoracic spine, the Launch Pad™ promotes improved scapular retraction and posture, with the intended effect of optimizing range of motion, correcting muscular imbalances, and transforming the bench press into a more effective and biomechanically sound exercise. By facilitating optimal movement patterns while supporting healthy joint alignment, it may provide a performance advantage over traditional bench press configurations.

The present study aimed to examine whether incorporating the Launch Pad™ into an 8-week bench press training program would result in greater improvements in upper-body strength and power, as assessed by the 1-RM BP, NFL-225 Test, and seated medicine ball throw (SMBT), compared to training with a traditional flat bench alone. While resistance training equipment innovations have been studied in various contexts, to our knowledge, no published research has specifically evaluated the performance benefits of an ergonomically designed bench press pad in a population of trained collegiate football athletes.

METHODS

Participants

Thirty male collegiate football players from a Southern California college participated in this study. The inclusion criteria specified that participants should be aged between 18-25 years and have a history of moderate resistance training, comprising at least 12 sessions of monthly exercise within the past 12 months. The exclusion criteria involved significant medical conditions such as musculoskeletal, cardiovascular, metabolic, pulmonary, or other disorders that could limit exercise capacity or increase the risk of adverse cardiovascular events during exercise. Additionally, individuals using performance-enhancing drugs that affect anabolic responses were excluded. All exploratory participants from UCLA provided written informed consent while ethical approval was obtained from UCLA (IRB: 11-003190). Off-site participants provided written informed consent and single IRB approval (sIRB: BRANY, NY, USA). Research practices were conducted in accordance with the ethical principles documented in the Declaration of Helsinki. Sample size of n = 30 was calculated based on a priori power analysis using the 1-RM bench press reported from an unpublished exploratory study using 5 resistance-trained, collegiate-aged males of similar design in our research laboratory assuming $a = 0.05$ and $B = 0.20$.

Study design

This study was an 8-week, single-blind, randomized controlled trial employing a parallel research design. Participants were randomly assigned in a 1:1 ratio to one of two groups within an off-season strength and conditioning program: the intervention group, using a novel bench press pad (BPAD) that laid on top of a standard flat bench, or the control group, utilizing a traditional flat bench (CONT). An independent investigator, who was not involved in participant recruitment, conducted the randomization using an online-generated random number program. Allocation was concealed using consecutively numbered envelopes. The participants exercised three times a week for eight weeks (totaling 24 sessions), with each session lasting between 45-60 minutes. An eight-week trial was chosen to ensure adequate training adaptation from both research groups. To avoid confounding variables, participants were instructed to refrain from additional resistance-type or high-intensity anaerobic training during the study period. All assessments and training sessions were conducted at an off-site training facility under the supervision of a staff member who is nationally certified by the National Strength and Conditioning Association (CSCS) and possess 15 years of experience. Dietary intake and macronutrient distribution were not regulated, except for the stipulation that participants must refrain from initiating any dietary supplement or weight management regimen that could impact total body mass or fat-free mass.

Bench Presses and Flys: Traditional (CONT) vs Bench Press Pad (BPAD)

Both groups used a standard flat utility bench (Flat Utility Bench 2.0, Rogue Fitness, Columbus, OH, USA) (Figure 1A) weighing 49 lbs., constructed of 2 x 3" 11-gauge steel, polyurethane foam pad, and angled, wide-set legs for stability. The bench press pad (BPAD), Launch Pad ™ (Advanced Muscle Mechanics), is made of high-density polyurethane foam with black anodized aluminum construction (30" L x 12.5" W x 3" H, weight 22 kg) and features an adjustable lumbar support that can be attached to most Olympic and competition benches as well as OEM standalone benches (Figure 1B).

Supervised, periodized training with and without a bench press pad

Both cohorts were integrated into the players' existing 8-week off-season training program. The proprietary strength and conditioning program, successfully executed annually for the past six years, aimed to optimize athletic performance in football. The primary objective, as outlined by the strength and conditioning coaches, was to "*maximally improve muscular strength, endurance and power of upper-and-lower body muscle groups,* *as well as speed, acceleration, agility, and core stability*" through diverse training methods and equipment within an indoor-outdoor facility featuring 40 yards of artificial turf adjacent to the weight room.

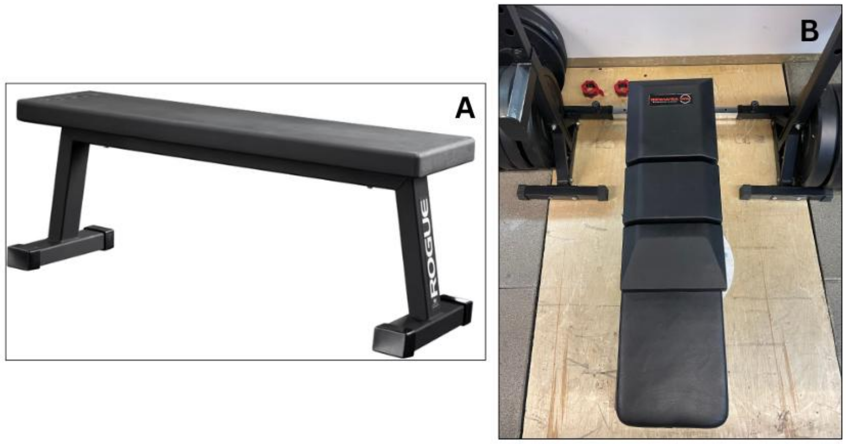

Figure 1. (A) Traditional flat bench utilized by both groups. (B) Bench press pad (BPAD) set up on top of a standard flat bench.

The bench press exercises were incorporated into the regular 1-hour sessions thrice weekly and divided into two identical block periods, which differed only in the equipment used (Table 1). The two blocks were designed to complement other training done by the athletes, aiming to prevent overtraining that might occur from increased upper body training in Block 1 and increased lower body training in Block 2. The training session comprised three chest press exercises, which were alternated throughout the session, resulting in the completion of 10-12 sets. These included upper and lower chest presses, as well as fly exercises, which enabled the application of different variations of external loads to the pectoral muscles.

Efforts were made to align starting loads with the athletes pre-determined one-repetition maximum (1-RM) for the Bench Press. Once these initial loads were established, subsequent adjustments involved progressive increases in the percentage of 1-RM and/or the volume of sets and repetitions of the exercises. Table 1 provides an outline of the training program along with a brief description of the exercises involved.

Positioning on the flat utility bench utilizing the bench press pad was standardized in accordance with the company's user manual. All trials were conducted with a consistent hand placement on the bar, approximately 150% of the participants' bi-acromial distance (Krzysztofik et al., 2020). For both groups, emphasis was placed on maintaining a stable, supine position on the bench, ensuring constant contact of the hips, gluteal complex, and feet with the bench and floor throughout the entire range of motion of the exercise.

The barbell (or dumbbells) was lowered until it made contact with the chest at the level of the nipples. Subsequently, without any bouncing, a press upwards towards full elbow extension was executed immediately. Throughout the exercise, a consistent tempo of approximately two seconds for the eccentric phase and a maximum of one second for the concentric phase was maintained. A trained research associate supervised each workout, ensuring the safety of the lift sequence by spotting and monitoring. The associate provided verbal assistance to maintain a controlled bar speed (Krzysztofik et al., 2020), recorded workout data, and ensured training compliance.

Table 1. An 8-week, two-block periodized bench press training program was implemented using either the intervention of a novel bench press pad or the control of a traditional flat bench press.

Flat Barbell Bench Press

- Block 1 (Wk. 1-4, sessions 1-12)

Wk. 1: 5 sets to failure, 50%, 60%, 70%, 70%, 80% 1-RM, 1 min rest between sets

Wk. 2: 5 sets to failure, 60%, 70%, 70%, 80%, 80% 1-RM, 1 min rest between sets

Wk. 3: 5 sets to failure, 70%, 70%, 80%, 85%, 85% 1-RM, 1:30 min rest between sets

Wk. 4: 5 sets to failure, 70%, 80%, 85%, 90%, 90% 1-RM, 1:30 min rest between sets

- Block 2 (Wk. 5-8, sessions 12-24)

Wk. 5: 4 sets to failure, 60%, 60%, 70%, 70% 1-RM, 1 min rest between sets

Wk. 6: 4 sets to failure, 70%, 70%, 70%, 80% 1-RM, 1 min rest between sets

Wk. 7: 4 sets to failure, 70%, 70%, 80%, 85% 1-RM, 1:30 min rest between sets

Wk. 8: 4 sets to failure, 70%, 80%, 85%, 90% 1-RM, 1:30 min rest between sets

Incline Barbell Bench Press

- Block 1 (Wk. 1-4, sessions 1-12)

Wk. 1: 3 sets to failure, 50%, 60%, 70% 1-RM, 1 min rest between sets

Wk. 2: 3 sets to failure, 60%, 70%, 80% 1-RM, 1 min rest between sets

Wk. 3: 3 sets to failure, 70%, 80%, 85% 1-RM, 1:30 min rest between sets

Wk. 4: 3 sets to failure, 70%, 85%, 90% 1-RM, 1:30 min rest between sets

- Block 2 (Wk. 5-8, sessions 12-24)

Wk. 5: 3 sets to failure, 50%, 60%, 70% 1-RM, 1 min rest between sets

Wk. 6: 3 sets to failure, 60%, 70%, 70% 1-RM, 1 min rest between sets

Wk. 7: 3 sets to failure, 70%, 70%, 80% 1-RM, 1:30 min rest between sets

Wk. 8: 3 sets to failure, 70%, 80%, 85% 1-RM, 1:30 min rest between sets

Flat Dumbbell Flys

- Block 1 (Wk. 1-4, sessions 1-12)

Wk. 1 - 3 sets to failure, 50%, 60%, 70%, 70% 1-RM, 1 min rest between sets

Wk. 2 - 3 sets to failure, 60%, 70%, 70%, 80% 1-RM, 1 min rest between sets

Wk. 3 - 3 sets to failure, 70%, 70%, 80%, 85% 1-RM, 1:30 min rest between sets

Wk. 4 - 3 sets to failure, 70%, 80%, 85%, 90% 1-RM, 1:30 min rest between sets

- Block 2 (Wk. 5-8, sessions 12-24)

Wk. 5 - 3 sets to failure, 50%, 60%, 70% 1-RM, 1 min rest between sets

Wk. 6 - 3 sets to failure, 60%, 70%, 70% 1-RM, 1 min rest between sets

Wk. 7 - 3 sets to failure, 70%, 70%, 80% 1-RM, 1:30 min rest between sets

Wk. 8 - 3 sets to failure, 70%, 80%, 85% 1-RM, 1:30 min rest between sets

Testing procedures

All participants were assessed at baseline and at the 8-week mark, adhering to identical protocols prior to each testing session. To ensure precision, reliability, and consistency in test administration, all pre- and post-assessments took place at the same location and time of day (specifically, early evening to optimize diurnal effects on performance) conducted by the same investigator. Each participant underwent a familiarization session during which all testing procedures were practiced until confidence and proper form were achieved. The following sequence and descriptions of tests were employed:

Anthropometric measures

Body mass and height

Body mass was measured using a calibrated medical scale with an accuracy of ±0.1 kg, and height was determined using a precision stadiometer (Seca, Hanover, MD, United States; accuracy ±0.01 m). Participants were instructed to fast, void their bladder, remove unnecessary clothing and accessories before weighing, and to remove their shoes before taking height measurements.

Body composition

Body fat percentage was measured using a validated octipolar, multi-frequency, multi-segmental bioelectrical impedance analyser (BIA) (InBody Co., Seoul, Korea Republic) (Dolezal et al., 2013). To ensure accuracy, participants adhered to standard pre-measurement BIA guidelines recommended by the American Society of Exercise Physiologists (Heyward, 2001). The test was performed after at least 3 hours of fasting and voiding, with participants instructed to remain hydrated and to not exercise 2 hours before testing. After investigators explained the procedure, the participants stood upright with their feet on two metallic footpads while holding handgrips with both hands. The instrument measured resistance and reactance using proprietary algorithms.

Performance measures

1-RM Bench Press Muscular Strength (1-RM BP)

Upper-body isotonic muscle strength was measured by determining 1-repetition maximum (1-RM) of a free-weight flat bench press using standardized procedure (Grgic et al., 2020). The 1-RM is defined as the highest weight lifted through one full range of motion after reaching volitional or momentary failure. Briefly, subjects performed a light warm-up including whole body exercise on a treadmill or cycle ergometer, followed by light stretching. Participants were allowed several practice trials of bench press with minimum resistance to ensure good form, full range of motion, and adequate breathing technique. The resistance was progressively increased following standard procedure, leading to an attempt to complete 1–2 repetitions at a load estimated to be near maximum. Subsequently, the participant rested for 2 minutes and then attempted to achieve the 1-RM. For each 1-RM trial, participants attempted 2 repetitions. If participants were able to complete 2 repetitions, they were given a 2-minute rest, and the load was increased. If participants failed the 1-RM attempt at the given weight, 2-minute rest was provided, and the load was decreased to the midpoint between the last successful lift and the failed lift.

The NFL 225-lb reps to-fatigue Bench Press Test (NFL-225 Test)

This test assesses upper body muscular strength and endurance. Participants performed the test with a load of 102.3 kg (225 lb), completing as many repetitions as possible without pause. After warming up individually, participants grasped the bar at the same position used during the 1RM procedure. No mandatory cadence was required for the repetition tests, but each participant maintained their own pace, with no more than a 2-second pause between repetitions. The bar had to touch the chest on each repetition without bouncing and be returned to full-arm extension. The head, upper back, and buttocks were kept in contact with the bench throughout the test. The test ended when the participant could no longer complete a repetition with proper form. Testing staff provided verbal encouragement during the test. Reliability for this procedure was high (intraclass correlation coefficient [ICC] = 0.987). (Chapman et al., 1998).

Seated Medicine Ball Throw (SMBT)

To execute the SMBT, participants held a 4.5 kg medicine ball (Ballistic Ball; Assess2Perform, Montrose, Colorado, USA) against their chest until they received an audible signal to commence the throw. At this point, they propelled the ball forward with maximal effort while ensuring continuous upper back contact with the bench throughout the entire motion. Guidance on the throw angle (approximately 40-45°) was given during both the warm-up sessions and familiarization. This angle was visually monitored but not quantitatively measured, nor were there any obstacles or targets that restricted it during testing. The horizontal distance of the thrown medicine ball was recorded from the base of the bench (with the "*zero*" mark of the tape measure aligned with the front edge of the seat) to the rearmost point of contact of the medicine ball upon first impact, with a measurement resolution of 5 cm (Beckham et al., 2019).

Statistical analysis

Statistical analysis was performed in SPSS v27.0 (IBM, NY, USA). Descriptive statistics are presented as mean ± standard deviation (SD). Statistical significance was determined based on $\alpha = .05$ and all tests were two-tailed. Continuous variables were first assessed for normality via Shapiro-Wilk tests. Paired *t*-tests and Wilcoxon signed-rank tests were used for within-group comparisons of 1-RM BP, NFL Test, and SMBT at baseline and after 8 weeks, depending on whether the variables were normally or non-normally distributed. Changes between groups after eight weeks of training were made by Welch's *t*-tests if data were normally distributed and Wilcoxon rank-sum tests if data deviated significantly from normality. A Holm-Bonferroni correction to control the familywise error rate was applied. Effect sizes were measured by Hedges' *g.*

RESULTS

All thirty participants successfully completed the 8-week training program with no missed sessions. No significant differences in age, height, body mass and body fat percentage were detected between groups at baseline and within groups from baseline to one-month post-training. Both groups exhibited significant improvements in 1-RM BP, NFL Test, and SMBT after 8 weeks (all $p < .001$). Moreover, the BPAD group showed a significantly greater increase compared to the CONT group in all performance outcome measures (all $p < .001$) (Table 2).

DISCUSSION

This study investigated the efficacy of a novel bench press pad (BPAD), designed to address biomechanical limitations of the traditional flat bench, to augment strength gains during a training program with collegiate football players. Over the course of the 8-week training protocol, both the experimental group using the BPAD and the control group using a traditional flat bench demonstrated significant performance improvements in the 1-repetition maximum bench press (1-RM BP), the NFL 225-lb bench press test (NFL-225 Test), and seated medicine ball throw (SMBT) (all $p < .001$). Notably, the BPAD group experienced significantly greater improvements across all measured outcomes relative to CONT (all $p < .001$), indicating a potential performance advantage when incorporating the BPAD equipment into a bench press-centred training regimen.

Table 2. Anthropometrics and 1-RM BP, NFL-225 Test, and SMBT at baseline and after 8 weeks training.

	CONT (control; n = 15)					
	Baseline	**8 Weeks**	**Δ**	***p*-within†**		
Age (yr)	22.5 ± 1.3	-	-	-		
Height (cm)	179.2 ± 5.7	-	-	-		
Body mass (kg)	84.5 ± 5.7	84.0 ± 3.4	-0.5 ± 2.9	.827		
Body fat (%)	11.7 ± 4.1	11.8 ± 4.6	-0.1 ± 2.9	.870		
1-RM BP (kg)	98.1 ± 4.5	107.2 ± 6.7	9.7 ± 3.4	<.001		
NFL-225 Test (reps)	14 ± 4.2	18 ± 5.0	4 ± 3.0	<.001		
SMBT (m)	3.5 ± 4.2	5.5 ± 4.1	2.0 ± 3.0	<.001		
	BPAD (intervention; n = 15)					
	Baseline	**8 Weeks**	**Δ**	***p*-within†**	***p*-between†**	**Hedges g**
Age (yr)	23.2 ± 1.9	-	-	-	-	-
Height (cm)	180.4 ± 6.4	-	-	-	-	-
Body mass (kg)	83.1 ± 6.5	83.3 ± 5.0	0.2 ± 3.1	.911	1.000	-
Body fat (%)	12.2 ± 5.0	12.1 ± 4.2	-0.1 ± 2.5	.886	1.000	-
1-RM BP (kg)	97.4 ± 5.8	116.8 ± 5.7	19.4 ± 4.3	<.001	<.001	3.99
NFL-225 Test (reps)	14 ± 3.8	21 ± 4.4	7 ± 3.8	<.001	<.001	3.67
SMBT (m)	3.4 ± 3.1	6.1 ± 4.2	2.7 ± 2.5	<.001	<.001	4.10

Note. Values are mean ± SD. No significant differences were observed at baseline between groups. 1-RM BP = one repetition maximum bench press; NFL Test = NFL 225-lb reps to-fatigue bench press; SMBT = Seated medicine ball throw.

In order to conduct a comprehensive evaluation of strength adaptations, we utilized a three-tiered approach. The 1-RM BP is intended to measure maximum upper body strength, the NFL-225 Test is indicative of muscular endurance (Sierer et al., 2008; Robbins, 2012; Robbins 2010), and the SMBT is a validated field test for assessing anaerobic power (Kumar et al., 2021). The sport-specific demands of American football require intermittent high-intensity bursts of movement and collision, which ultimately necessitate a balanced combination of both strength and endurance (Edwards et al., 2017). The association between physical attributes, including strength, endurance, speed, and agility, and performance at the highest levels of competition is well-established (Robbins, 2011). Although the 1-RM BP is not typically assessed at the NFL scouting combine, an estimate can be derived using an equation that incorporates NFL-225 Test performance. Notwithstanding, maximal strength may be underestimated by this equation when an athlete exceeds 10 repetitions (Mayhew et al., 1999). Therefore, the direct assessment of 1-RM BP in the present study addresses this concern to supplement the endurance-focused performance measured by the NFL-225 Test. Taken altogether, the significant performance improvements in the 1-RM BP, NFL-225 Test, and SMBT suggest notable enhancements in upper body strength, endurance, and power that may prove to be beneficial for these athletes.

Previous investigation from our laboratory has established that, when used in combination with a connected adaptive resistance exercise (CARE) machine, the BPAD can elicit significantly greater 1-RM improvements compared to a traditional flat bench over a four week training period (Goldman et al., in press). Notably, a superior improvement in 1-RM performance associated with BPAD utilization was observed in both the previous and present studies. Although the magnitude of 1-RM improvement may have been lower in comparison to the previous study (~66% versus ~20%, respectively), this may be attributed to the differences in participant demographics. Although both cohorts included males with a history of resistance training, the present study exclusively examined collegiate football players. Elite athletes typically exhibit lower hypertrophic responses to training, which necessitate higher training intensity and volume in order to elicit greater strength improvements (Aslam et al., 2025; May et al., 2022). It is possible that the high-calibre athletes that participated in this study may have required more novel and/or intense stimuli in order to observe improvements of a greater magnitude. To this end, the present study did not utilize the same eccentric overload-inducing CARE machine, which may have been another contributing factor to these findings. However, it should be noted that a significantly greater 1-RM improvement was still observed in the BPAD group relative to CONT, along with the NFL-225 Test and SMBT performance, despite these methodological differences.

These enhanced results may be explained by improved lifting mechanics facilitated by the BPAD. The device is designed to promote better spinal alignment and scapular retraction, which may help increase activation of the chest musculature, particularly the pectoralis major, during pressing movements. Contemori et al. (2019) found that scapular retraction leads to higher trapezius muscle activation, which stabilizes the scapula and enhances shoulder function. Consequently, this increased activation can directly support chest musculature by creating a stable base for the pectoral muscles to exert force. This improved positioning can lead to more efficient force production and may reduce mechanical limitations commonly associated with traditional flat bench presses. Furthermore, enhanced joint stability, specifically of the shoulder, may also contribute to improved range of motion and overall training quality. Compromised bench press conditions, such as bench instability and/or movement along with reduced shoulder joint range of motion, can reduce peak power and force generation (Koshida et al., 2008). Unstable bench press conditions can also have detrimental effects on muscle activation, as lower electromyographic activation in the pectoralis major was observed in response to similar unstable conditions (Saeterbakken & Fimland, 2013). We posit that the support conferred with the BPAD may at least partially address many of these biomechanical constraints associated with the traditional flat bench press.

The findings of this study are relevant to strength and conditioning coaches, athletic trainers, and athletes aiming to maximize performance outcomes through resistance training. Given the importance of upper-body strength in football-specific tasks such as blocking, tackling, and resisting physical contact, even marginal improvements in pressing performance can provide meaningful benefits during gameplay. Upper-body strength, endurance, and power can be significantly enhanced through the bench press exercise, especially as it relates to the demands of American football (Hrysomallis, 2010). This study suggests that simple equipment modifications, such as the use of the BPAD, can lead to salient strength gains when implemented in a periodized training regimen. Given the convenience and time-efficient setup of the BPAD, this may serve as an accessible ergogenic aid that can benefit American football athletes at nearly every level of competition.

Certain limitations should be acknowledged when considering the implications of this study. The participant pool was relatively small and limited to healthy, resistance-trained male collegiate football players. As a result, the findings may not be generalizable to other populations such as females, younger athletes, or those without prior resistance training experience. Additionally, while every effort was made to keep the training volume and intensity consistent between groups, other elements of the broader training program may have contributed to performance changes. However, key strengths to the study include a sufficient training period to assess the device over time and the randomized control trial design, which minimizes bias and establishes stronger inferences in regard to the BPAD compared to CONT. Future studies would benefit from including a third comparison group that completes the same overall training program without performing any bench press-specific exercises. This would allow researchers to better determine how much of the observed improvement is directly tied to the bench press modality itself, as opposed to general improvements from comprehensive training. Moreover, the primary interpretations of this study are predicated on the BPAD conferring enhanced stability throughout the bench press movement. Further validation of this support, such as through measuring muscle activation via surface electromyography, is warranted for future research.

CONCLUSION

The present study is the first to demonstrate the efficacy of the BPAD Launch Pad ™ in a structured strength training program for collegiate football players. This study provides initial evidence supporting the use of a novel bench press pad as a means to enhance upper-body strength and power in trained athletes. When integrated into an appropriately structured training plan, the BPAD appears to offer a practical and effective method to improve bench press performance beyond what is typically achieved using standard equipment. For athletes aiming to maximize their strength training results, the BPAD is a valuable tool for optimizing upper body strength and power throughout training cycles.

AUTHOR CONTRIBUTIONS

The study was conceived and designed by A.E.B., T.Y., and B.A.D. A.E.B., K.J.H., and B.A.D. performed data collection. A.E.B., T.Y., E.V.N., and B.A.D. completed data analysis. A.E.B., J.A.K., T.Y., E.V.N., and B.A.D. interpreted data and composed the manuscript while P.G. and K.J.H. made crucial edits. All authors have read and agreed to the published version of the manuscript.

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DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

ETHICS COMMITTEE APPROVAL

This study was performed in accordance with the ethical standards of the Helsinki Declaration and was approved by the UCLA Institutional Review Board (#11-003190). All participants provided written informed consent.

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