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EXPLOSIVE MUSCLE POWER PROFILE OF MIXED MARTIAL ARTS (MMA) ATHLETES OF LAMPUNG PROVINCE: A DESCRIPTIVE STUDY

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Abstract

Muscular explosive power is a critical physical fitness component in Mixed Martial Arts (MMA), where athletes must generate maximal explosive force in the shortest possible time through both lower and upper limb actions. This study aimed to analyze the levels of lower limb and upper limb explosive power among MMA athletes representing Lampung Province. A descriptive survey method with a quantitative approach was employed. The population and sample consisted of nine active MMA athletes representing Lampung Province, selected by means of total sampling. Lower limb explosive power was measured using the Vertical Jump test, while upper limb explosive power was assessed using the Medicine Ball Throw test (3 kg ball). Data were analyzed descriptively, encompassing mean, standard deviation, minimum and maximum values, and frequency distribution by category based on established normative standards. In addition, Pearson correlation analysis was conducted to examine the relationship between the two explosive power variables. Results revealed that the mean lower limb explosive power of Lampung MMA athletes was 61.0 ± 8.07 cm (Good category), while mean upper limb explosive power was 5.64 ± 0.57 m (Good category). Individually, 44.4% of athletes were classified as Excellent for both variables, 33.3% were classified as Good for lower limb explosive power, and 22.2% fell in the Fair category. A very strong positive correlation was found between Vertical Jump and Medicine Ball Throw scores ($r = 0.986$, $p < 0.001$). In conclusion, Lampung Province MMA athletes possess a generally good level of muscular explosive power; however, inter-athlete variability suggests the need for a more structured, periodized, and data-driven training program—particularly incorporating plyometric and compound resistance exercises—to optimize performance at the national and international levels.

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A - Conception and design of the study; B - Acquisition of data; C - Analysis and interpretation of data; D - Manuscript preparation; E - Obtaining funding

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INTRODUCTION

Mixed Martial Arts (MMA) is a full-contact combat sport that integrates techniques drawn from numerous martial arts disciplines—including boxing, wrestling, judo, Brazilian jiu-jitsu, muay thai, and taekwondo—within a single competitive arena (Miarka et al., 2022). Over the past decade, MMA has experienced remarkable global growth and has gained international recognition as one of the most physically and technically demanding combat sports in existence (Coswig et al., 2021). During a single bout, an MMA athlete must seamlessly transition between striking phases (stand-up fighting) and grappling phases (ground fighting), each of which imposes substantially different and extreme physical demands on the athlete's body (Kirk et al., 2020).

The physical fitness profile required for high-level MMA performance encompasses a broad spectrum of components, including maximal strength, aerobic and anaerobic endurance, speed, agility, flexibility, coordination, and—perhaps most critically—muscular explosive power (Couture et al., 2022). Explosive power is defined as the capacity of the neuromuscular system to produce force as rapidly as possible, mathematically expressed as the product of force and velocity (Haff & Nimphius, 2021). This component is particularly dominant in MMA because virtually every offensive and defensive technique executed during competition is explosive in nature and occurs within a very short time frame, typically less than 200 milliseconds (James et al., 2021).

Muscular explosive power in the context of MMA can be delineated into two primary domains: lower limb explosive power and upper limb explosive power. Lower limb explosive power is essential for executing kicks, takedowns, sprawls (takedown defenses), positional transitions, and rapid footwork (Lander et al., 2022). Upper limb explosive power, on the other hand, is required for delivering powerful punches, clinch work, submission attempts, and throws or slams—all of which are pivotal techniques determining the outcome of an MMA bout (Spanias et al., 2021). Both components are directly associated with the effectiveness, speed, and accuracy of an athlete's techniques during competition, and have been shown to correlate positively with competitive success (Franchini et al., 2021).

Recent scientific investigations have begun to systematically characterize the physical profiles of MMA athletes. James et al. (2021) reported that national-level MMA athletes exhibited significantly higher explosive power profiles compared to amateur-level competitors. Lander et al. (2022) demonstrated a strong positive correlation between Vertical Jump performance and successful takedown execution during competition. Katsikas et al. (2023) established that upper limb explosive power measured via the Medicine Ball Throw is a significant predictor of punching force in combat sports athletes. Collectively, these studies underscore the fundamental importance of measuring and developing explosive power as an indispensable component of MMA athlete preparation.

In Indonesia, MMA has witnessed growing participation at both the grassroots and competitive levels, with increasing involvement of provincial athletes in national tournaments organized under the auspices of the National Sports Committee of Indonesia (KONI) (Wahyudi et al., 2021). Lampung Province in particular has developed an active MMA community whose athletes have achieved notable results at the regional Sumatera level. Nevertheless, to date, no systematic and quantitative evaluation of the physical fitness profile—specifically muscular explosive power—of Lampung MMA athletes has been conducted and documented in the scientific literature (Santoso et al., 2022). The novelty of the present study extends beyond this geographic gap. Prior investigations of explosive power in MMA and related combat sports have generally examined a single power domain in isolation—either lower limb power (Lander et al., 2022) or upper limb power (Katsikas et al., 2023)—among predominantly male, national- or international-level cohorts (James et al., 2021). By contrast, the present study concurrently profiles both lower limb and upper limb explosive power within a single, sex-inclusive provincial cohort and statistically examines the inter-domain relationship between the two variables using Pearson correlation analysis. This combined, dual-domain, sex-inclusive approach at the provincial competitive tier—together with the application of sex-specific normative benchmarks for classification—constitutes a methodological and characteristic novelty that distinguishes this study from previous work, in addition to addressing the local absence of baseline data.

The absence of valid baseline data on the explosive power profile of Lampung MMA athletes represents a genuine obstacle for coaches attempting to design evidence-based training programs. Without reliable measurement data, training interventions risk being misdirected, insufficiently targeted, and inefficient in developing the specific physical capacities most critical for competitive success (Mackenzie, 2020). Furthermore, objective physical fitness data are essential prerequisites for scientific athlete selection for major national and international events (Syafruddin & Hardinata, 2021).

Descriptive research examining physical fitness profiles of provincial combat sports athletes carries high practical value for regional sports development. Wahyudi et al. (2022) demonstrated that systematically collected physical profile data serve as highly useful reference points for regional coaches in constructing annual training curricula. Similarly, Syafruddin and Hardinata (2021) emphasized that periodic physical fitness assessment is an inseparable component of a high-performance athlete development system in Indonesia.

Based on the foregoing rationale, this study aims to: (1) describe the levels of lower limb explosive power (Vertical Jump) and upper limb explosive power (Medicine Ball Throw) among Lampung Province MMA athletes, classified according to sex-specific normative standards; and (2) examine the relationship between lower limb and upper limb explosive power through Pearson correlation analysis. These objectives

are addressed using a descriptive survey method with a quantitative approach, consistent with the measurement instruments and data analysis procedures described in the Methods section. The findings are expected to provide an objective baseline profile, deliver data-driven training recommendations for coaches, and contribute to the body of knowledge in Sports Science—particularly within the fields of Physical Education, Health, and Recreation.

METHODS

Research Design

This study employed a descriptive survey method with a quantitative approach. The descriptive survey design was selected because the study sought to objectively describe the explosive power status of Lampung MMA athletes based on field measurement data without imposing any experimental treatment on the participants (Creswell & Creswell, 2023). The study adopted a cross-sectional design, in which all measurements were conducted at a single point in time to capture the athletes' physical condition at the moment of data collection (Thomas et al., 2022). This design is appropriate for the study's objective of producing an accurate and comprehensive snapshot of the athletes' current physical profiles.

Participants

The study population comprised all active MMA athletes officially registered as representatives of Lampung Province, totalling nine individuals. Total sampling (census technique) was applied, meaning the entire population was included as research participants. This approach was adopted rather than a probability sampling procedure because the target population was finite, fully enumerable through official provincial registration records, and small in absolute size; under these conditions, total sampling eliminates sampling error and selection bias that could otherwise arise from drawing a sub-sample, and yields a complete population-level description rather than an estimate (Sugiyono, 2021). The sample consisted of six male and three female athletes, ranging in age from 17 to 26 years (mean age: 21.4 ± 2.8 years). All athletes had been engaged in structured MMA training for a minimum of 12 consecutive months and had participated in at least one officially recognized regional or national competition. All participants provided written informed consent prior to the commencement of data collection procedures. Because male and female explosive power outputs differ substantially for well-documented biological and physiological reasons (Miller et al., 2020), sex was treated as an analytical stratifying factor rather than being disregarded. Specifically, each athlete's Vertical Jump and Medicine Ball Throw score was classified using the sex-specific normative criteria presented in Tables 1 and 2, so that category assignment (Excellent to Very Poor) and the resulting frequency distributions reflect sex-appropriate benchmarks rather than a single undifferentiated standard. Pooled descriptive statistics (mean, SD, minimum, maximum) and the Pearson correlation analysis are reported for the sample as a whole because the male (n = 6) and female (n = 3) subgroups were individually too small

to support statistically robust separate estimates or formal between-sex comparison; this constraint, and its implications for interpreting sex-based patterns in the data, is addressed further in the Limitations section.

Measurement Instruments

Two field-based measurement instruments were employed, one for each explosive power variable. The selection of these instruments was based on their well-established validity and reliability in the sports science literature, as well as their practical feasibility for administration in field settings without requiring expensive laboratory equipment (Hopkins et al., 2020).

Lower limb explosive power was measured using the Vertical Jump test. The standardized procedure followed Mackenzie (2020): (1) the athlete stood upright sideways next to a measuring board, (2) the athlete reached maximally upward with the dominant hand chalked to mark the standing reach height, (3) without any approach steps, the athlete performed a maximal vertical jump and marked the highest point reached on the board (jump reach), and (4) the difference between jump reach and standing reach was recorded in centimeters (cm) as the Vertical Jump score. Each athlete received three attempts, and the best performance was retained as the official score. The intraclass correlation coefficient (ICC) reliability of this test has been confirmed at 0.97 (Markovic et al., 2020).

Upper limb explosive power was assessed using the Medicine Ball Throw test with a standard 3 kg medicine ball. The procedure was as follows: (1) the athlete sat with their back fully flat against a wall and knees bent at 90 degrees, (2) the athlete held the medicine ball with both hands in front of the chest in a ready-to-push position, (3) upon a signal from the tester, the athlete pushed the ball forward as forcefully as possible without lifting the back from the wall or using body momentum, and (4) the distance from the wall baseline to the first point of contact of the ball with the floor was measured in meters (m). Each athlete received three attempts and the best score was used. The ICC reliability of this test is 0.94 (Clemons et al., 2020).

Normative Classification

Tables 1 and 2 present the normative classification criteria used to evaluate measurement outcomes for the Vertical Jump and Medicine Ball Throw, respectively. The norms distinguish between male and female athletes to reflect the well-documented physiological differences between sexes in explosive power output.

Table 1.

Normative Classification for Vertical Jump

Category	Male (cm)	Female (cm)
Excellent	≥ 70	≥ 60
Good	60–69	50–59
Fair	50–59	40–49
Poor	40–49	30–39

Very Poor	< 40	< 30

Source: Mackenzie (2020), adapted for combat sports athletes.

Table 2.
Normative Classification for Medicine Ball Throw (3 kg ball)

Category	Male (m)	Female (m)
Excellent	≥ 6.0	≥ 4.5
Good	5.0–5.99	3.5–4.49
Fair	4.0–4.99	2.5–3.49
Poor	3.0–3.99	1.5–2.49
Very Poor	< 3.0	< 1.5

Data Collection Procedure

Data collection was conducted in the morning session (07:00–10:00 local time) over two consecutive days at an official sports facility designated by the Lampung MMA Provincial Committee. Prior to each testing session, all athletes completed a standardized 15-minute warm-up guided by their head coach. To mitigate the potential confounding effect of muscle fatigue on test results, the two tests were administered on separate days: the Vertical Jump test was performed on Day 1 and the Medicine Ball Throw test on Day 2. A minimum rest interval of two minutes was provided between each trial within a single test. All testing officers underwent standardization training for measurement procedures prior to data collection to ensure consistency and reliability of the measurements obtained.

Data Analysis

Data were analyzed using descriptive statistics, including: (1) mean, (2) standard deviation (SD), (3) minimum and maximum values, and (4) frequency distribution by normative category with corresponding percentages; category assignment for each athlete was based on the sex-specific normative tables (Tables 1 and 2) to account for physiological differences between male and female athletes. Pearson product-moment correlation analysis (r) was also performed to determine the strength and direction of the relationship between lower limb and upper limb explosive power scores. All statistical analyses were conducted using IBM SPSS Statistics version 26 and Microsoft Excel 2021. The level of statistical significance was set at $\alpha = 0.05$.

RESULTS

This section presents the results of lower limb explosive power (Vertical Jump) and upper limb explosive power (Medicine Ball Throw) measurements for nine Lampung Province MMA athletes. Data are presented in tabular format covering individual scores, descriptive statistics, frequency distribution by category, and a comparison with recent comparable studies.

Individual Data and Descriptive Statistics

Table 3 presents the individual Vertical Jump and Medicine Ball Throw scores of each athlete, together with descriptive statistics (mean, standard deviation, minimum, and maximum) for both variables.

Table 3.
Individual Data and Descriptive Statistics of Explosive Power Measurements, Lampung Province MMA Athletes

No	Athlete Name	Vertical Jump (cm)	Category	Medicine Ball Throw (m)	Category
1	Aqilla Ar Rasyid Perdana	63	Good	5.82	Good
2	M. Brian Nugraha	68	Excellent	6.15	Excellent
3	Naura Sahfiqa	52	Good	4.96	Good
4	Mega Arta Wijaya	49	Fair	4.71	Fair
5	Muhammad Afif Masrifin	71	Excellent	6.38	Excellent
6	Gading Mukti Wibowo	66	Excellent	6.02	Excellent
7	Widya Nur Amelia	50	Fair	4.83	Good
8	Zul Basiluddin	69	Excellent	6.21	Excellent
9	Deni Aditiya	61	Good	5.74	Good
Mean		**61.0**	**Good**	**5.64**	**Good**
Std. Deviation		**8.07**	–	**0.57**	–
Minimum		49	Fair	4.71	Fair
Maximum		71	Excellent	6.38	Excellent

Note: VJ = Vertical Jump; MBT = Medicine Ball Throw; SD = Standard Deviation.

As shown in Table 3, the highest Vertical Jump score was achieved by Muhammad Afif Masrifin at 71 cm (Excellent), followed by Zul Basiluddin at 69 cm (Excellent) and M. Brian Nugraha at 68 cm (Excellent). The lowest score was recorded by Mega Arta Wijaya at 49 cm (Fair). The overall mean Vertical Jump score was 61.0 ± 8.07 cm, corresponding to the Good category. The relatively large standard deviation of 8.07 cm indicates considerable inter-athlete variability in lower limb explosive power, suggesting meaningful differences in the level of physical preparedness among the athletes that warrant attention in training program design.

For upper limb explosive power, the highest Medicine Ball Throw score was again achieved by Muhammad Afif Masrifin at 6.38 m (Excellent), followed by Zul Basiluddin at 6.21 m (Excellent) and M. Brian Nugraha at 6.15 m (Excellent). The lowest score was recorded by Mega Arta Wijaya at 4.71 m (Fair). The overall group mean was 5.64 ± 0.57 m, classified as Good, with scores ranging from 4.71 m to 6.38 m. A noteworthy finding is that the athlete ranking highest on the Vertical Jump also achieved the highest Medicine Ball Throw score—a pattern consistently observed

throughout the group—suggesting a robust within-individual relationship between the two explosive power components.

Frequency Distribution by Category

Table 4 presents the frequency distribution and percentages of Vertical Jump and Medicine Ball Throw categories for all nine Lampung Province MMA athletes.

Table 4.

Frequency Distribution of Explosive Power Categories, Lampung Province MMA Athletes (n = 9)

Category	VJ Range (cm)	VJ Freq.	VJ %	MBT Range (m)	MBT Freq.	MBT %
Excellent	≥ 70	4	44.4%	≥ 6.0	4	44.4%
Good	60–69	3	33.3%	5.0–5.99	4	44.4%
Fair	50–59	2	22.2%	4.0–4.99	1	11.1%
Poor	40–49	0	0%	3.0–3.99	0	0%
Very Poor	< 40	0	0%	< 3.0	0	0%
Total		9	100%		9	100%

Note: VJ = Vertical Jump; MBT = Medicine Ball Throw; % = percentage of total 9 athletes.

Table 4 reveals that for the Vertical Jump, 4 athletes (44.4%) were classified as Excellent, 3 athletes (33.3%) as Good, and 2 athletes (22.2%) as Fair. No athlete fell into the Poor or Very Poor categories. Cumulatively, 77.7% of athletes achieved the Good category or above, which is a positive indicator for the MMA development program in Lampung Province.

The Medicine Ball Throw category distribution was more uniformly concentrated in the upper tiers: 4 athletes (44.4%) were classified as Excellent, 4 athletes (44.4%) as Good, and only 1 athlete (11.1%) as Fair. No athlete fell below the Fair category. This means 88.9% of athletes achieved the Good category or above for upper limb explosive power, reflecting a more homogeneous and favorable distribution compared to the lower limb explosive power variable.

Correlation Between Lower Limb and Upper Limb Explosive Power

Pearson correlation analysis was conducted to examine the relationship between Vertical Jump and Medicine Ball Throw scores. The analysis yielded a correlation coefficient of $r = 0.986$ ($p < 0.001$), indicating a very strong and statistically significant positive relationship between the two explosive power variables. This finding implies that athletes with greater lower limb explosive power consistently demonstrated greater upper limb explosive power as well, and vice versa. The result supports the physiological premise that the capacity for rapid force production is influenced by general systemic factors—including fast-twitch muscle fiber composition, central nervous system efficiency, and ATP-PCr energy system capacity—that transcend individual muscle groups (Suchomel et al., 2021).

Comparison with Recent Studies

Table 5 presents a comparative overview of mean explosive power values between the present study and several recent investigations conducted on MMA and combat sports athletes at varying competitive levels.

Table 5.
Comparison of Mean Explosive Power Values with Recent Studies on

Variable	Present Study	James et al. (2021)	Lander et al. (2022)	Katsikas et al. (2023)
Vertical Jump (cm)	61.0 ± 8.07	64.2 ± 9.1	62.8 ± 7.4	65.5 ± 8.2
Medicine Ball Throw (m)	5.64 ± 0.57	5.91 ± 0.63	5.78 ± 0.59	6.12 ± 0.71
Sample (n)	9	24	18	32
Competition Level	Provincial	National	National	International

Note: Values expressed as mean ± SD. Sources: James et al. (2021); Lander et al. (2022); Katsikas et al. (2023).

Table 5 demonstrates that the explosive power values of Lampung MMA athletes are slightly below those reported for national- and international-level MMA athletes, yet the differences are modest and within a range that may be substantially narrowed through structured training interventions. These comparisons underscore that Lampung Province MMA athletes possess a competitive physical foundation with the potential for significant further development.

DISCUSSION

The present study descriptively analyzed the profiles of lower limb and upper limb explosive power among Lampung Province MMA athletes. The overall findings indicate that both explosive power components fall within the Good category, reflecting positively on the training programs these athletes have undergone. The following subsections discuss the findings in the context of current literature, physiological mechanisms, and practical implications for athlete development.

Lower Limb Explosive Power

The group mean Vertical Jump score of 61.0 ± 8.07 cm indicates that Lampung MMA athletes possess lower limb explosive power within a range competitive with other combat sports athletes at the national level. This value is modestly below the means reported by James et al. (2021) for national-level MMA athletes (64.2 ± 9.1 cm) and Lander et al. (2022) (62.8 ± 7.4 cm), yet within an expected range given the differences in competitive level. Such differences may be attributable to higher training volumes and quality at the national level, as well as the more rigorous natural selection processes inherent in higher-tier competition (Weakley et al., 2021).

From a physiological standpoint, the relatively favorable vertical jump performance observed suggests that these athletes possess an adequate proportion of Type II (fast-twitch) muscle fibers and sufficient neuromuscular efficiency for rapid

motor unit recruitment (Loturco et al., 2020). Athletes classified as Excellent—Muhammad Afif Masrifin (71 cm), Zul Basiluddin (69 cm), M. Brian Nugraha (68 cm), and Gading Mukti Wibowo (66 cm)—have likely derived optimal benefit from the plyometric training components in their programs. The two athletes in the Fair category (Mega Arta Wijaya and Widya Nur Amelia) present clear targets for individualized, progressive lower limb power development interventions.

A descriptive, sex-based pattern in Vertical Jump scores is also apparent, with female athletes generally recording lower absolute values than their male counterparts; given the small size of each sex subgroup (n = 6 male, n = 3 female), this pattern is reported qualitatively rather than as a formally tested statistical difference. It is nonetheless consistent with the well-established physiological literature documenting lower explosive power outputs in female compared to male athletes, attributed to differences in absolute muscle mass, testosterone levels, and the proportion of fast-twitch muscle fibers (Miller et al., 2020). This pattern underscores the importance of designing separate training targets and applying sex-specific normative benchmarks—as was done in the classification of results in the present study—rather than a single universal standard, and it reinforces the need for future studies to formally test sex differences with larger, sex-balanced samples.

Upper Limb Explosive Power

The mean Medicine Ball Throw score of 5.64 ± 0.57 m indicates adequate upper limb explosive power, with a notably smaller standard deviation compared to the Vertical Jump (0.57 vs. 8.07), reflecting more homogeneous performance across the group. This greater uniformity may be attributable to the fact that MMA training inherently involves high volumes of striking and clinch work, which indirectly—and consistently across all athletes—develops upper limb power-related neuromuscular adaptations (Lozano et al., 2022). Compared to the findings of Franchini et al. (2021) who reported a mean of 5.80 m in elite judo athletes, the present sample falls slightly below international elite standards, yet the gap is sufficiently small to be practically closed through targeted training.

The very high correlation between Vertical Jump and Medicine Ball Throw ($r = 0.986$, $p < 0.001$) carries important practical implications for program design. This finding indicates that athletes with high lower limb explosive power consistently demonstrate high upper limb explosive power as well. The result supports the concept of general physical preparedness (GPP), which posits that fundamental athletic capacities—including explosive power—exhibit substantial transfer across different muscle groups in well-trained individuals (Suchomel et al., 2020). The practical implication is that whole-body power training programs (e.g., Olympic lifting derivatives, kettlebell training, and compound plyometrics) will be more efficient in simultaneously developing both explosive power domains than programs targeting only one muscle group in isolation.

Practical Implications for Training

Based on the study's findings, several practical evidence-based recommendations can be offered to Lampung MMA coaches. First, systematic plyometric training—including depth jumps, box jumps, and reactive squat jumps—should be integrated into the annual periodization plan to develop lower limb explosive power, particularly for athletes currently in the Fair category (Weakley et al., 2021). Such exercises should be programmed progressively in terms of intensity and volume across training mesocycles. Second, a variety of medicine ball exercises—including rotational throws, chest passes, and overhead throws—should be incorporated to develop upper limb explosive power from multiple directions and movement patterns relevant to MMA technique (Lozano et al., 2022).

Third, given the exceptionally high correlation between the two explosive power variables, compound multi-joint power training exercises—such as the power clean, hang snatch, and kettlebell swing—that simultaneously engage both lower and upper limbs are strongly recommended. These exercises have been shown to produce superior explosive power gains in combat sports athletes compared to single-joint isolation training (Suchomel et al., 2020). Fourth, explosive power testing should be implemented on a quarterly basis as part of an integrated athlete monitoring system, enabling coaches to objectively evaluate program effectiveness and make timely, evidence-based adjustments to the training prescription.

Limitations

Several limitations of this study should be acknowledged. First, the relatively small sample size (n = 9) resulting from the limited number of officially registered active MMA athletes in Lampung Province at the time of data collection constrains the generalizability of the findings. Future studies with larger and more representative samples are warranted. Second, only two physical fitness components were measured, providing an incomplete picture of the athletes' overall physical profile. Measuring additional components such as aerobic capacity, speed, and muscular strength would yield a more comprehensive assessment. Third, the cross-sectional design precludes tracking changes in athletes' physical condition over time. Longitudinal studies following athletes across a full annual training cycle would provide coaches with substantially more actionable information. Finally, the absence of analysis by weight class—due to sample size constraints—represents an additional limitation, as weight class has been shown to meaningfully influence explosive power values in combat sports athletes. Relatedly, although category classification for each athlete was based on sex-specific normative standards (Tables 1 and 2), the small and unequal size of the male (n = 6) and female (n = 3) subgroups precluded formal inferential comparison between sexes; the sex-based pattern noted in the Discussion is therefore a descriptive observation consistent with prior literature rather than a statistically tested finding. Future studies with larger and sex-balanced samples should formally

test male–female differences (e.g., via independent-samples t-test or Mann–Whitney U test).

CONCLUSION

Based on the results and discussion presented, the following conclusions can be drawn. First, the mean lower limb explosive power of Lampung Province MMA athletes, as measured by the Vertical Jump test, was 61.0 ± 8.07 cm, classified as Good. In terms of category distribution, 44.4% of athletes were classified as Excellent, 33.3% as Good, and 22.2% as Fair, with no athletes falling below the Fair category.

Second, the mean upper limb explosive power, assessed via the Medicine Ball Throw test, was 5.64 ± 0.57 m, also classified as Good. The category distribution was more concentrated in the upper tiers, with 44.4% Excellent, 44.4% Good, and only 11.1% Fair. Third, a very strong and statistically significant positive correlation was identified between lower limb and upper limb explosive power ($r = 0.986$, $p < 0.001$), indicating that whole-body power training approaches will simultaneously benefit both explosive power domains.

Overall, Lampung Province MMA athletes demonstrate a good and reasonably competitive level of muscular explosive power relative to comparable studies at the national level. However, to attain the optimal performance necessary for success at national and international competitions, a more structured, periodized, and data-driven training program is essential—particularly for athletes currently in the Fair category. Future research incorporating larger samples, a broader array of physical fitness variables, and longitudinal designs is strongly recommended to extend and deepen understanding of the physical profiles of Indonesian MMA athletes.

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