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Original Article

Concurrent validity and agreement between my jump 2 and an infrared contact mat for measuring squat and countermovement jump height and elasticity index in university basketball players

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Abstract
Problem statement: Courtside monitoring of jump performance in basketball increasingly relies on portable, field-deployable technologies. Determining whether a smartphone video application and an infrared contact mat (IR-Mat) provide interchangeable estimates of squat jump (SJ) and countermovement jump (CMJ) height—and the derived Elastic Index (EI)—is critical for valid athlete monitoring. Approach: In a single-session, cross-sectional method–comparison study, fourteen male university basketball players performed maximal-effort SJ and CMJ trials. Performance was recorded concurrently using My Jump 2 (smartphone video application, 240 frames·s^{-1}) and an IR-Mat. The primary outcomes were jump height (SJ, CMJ) and the Elastic Index, calculated as EI = ((CMJ − SJ) / SJ) × 100. Analyses included paired mean differences (My Jump 2 − IR-Mat), Pearson correlations, intraclass correlation coefficients for absolute agreement (two-way random effects, single measure), Bland–Altman bias and 95% limits of agreement with proportional-bias testing, typical error and coefficient of variation, and equivalence testing via two one-sided tests (TOST) using a priori bounds (±2 cm for height; ±5% for EI).
Keywords: field testing; sport technology; jump performance assessment; neuromuscular evaluation; performance diagnostics.

Introduction

Modern basketball is characterized by high-intensity intermittent efforts, requiring athletes to repeatedly perform explosive movements such as accelerations, decelerations, changes of direction, and vertical jumps. Consequently, the systematic monitoring of neuromuscular status has become a cornerstone of high-performance training, aiming to optimize load management and mitigate injury risk. In this context,vertical jump testing is central to performance assessment and monitoring in basketball because it captures lower-limb neuromuscular function with high ecological validity and minimal equipment burden. Among common protocols, the squat jump (SJ) and countermovement jump (CMJ) are complementary—SJ emphasizing concentric force production and CMJ reflecting the contribution of the stretch–shortening cycle (SSC), which typically yields greater jump height than SJ (Bobbert et al., 1996).

Beyond EI, time-normalized indices capture complementary facets of SSC function. The Reactive Strength Index (RSI)—jump height divided by ground contact time in a drop jump—targets fast SSC behavior and shows high reliability in elite basketball settings (Markwick et al., 2015). The Reactive Strength Index–modified (RSImod)—jump height divided by time to take-off in a CMJ—indexes reactive capacity over longer coupling times and is more field-friendly when force plates are unavailable (Ebben & Petushek, 2010; Pérez-Castilla et al., 2021). Although related, RSI and RSImod are not interchangeable (Louder et al., 2021), and device/method choices can influence estimates (Montalvo et al., 2021; Montoro-Bombú et al., 2022). Importantly, recent evidence suggests that EI (≡ EUR) may reflect more than "elastic gain" alone: higher EI can also arise from suboptimal SJ force expression or muscle mechanical properties (Kozinc et al., 2022a). Comparative work indicates that time-based indices often show stronger associations with explosive performance than EI, while conveying complementary information (Louder et al., 2021; McMahon et al., 2021). This broader context—spanning SSC mechanics (McBride et al., 2008; Wilson & Flanagan, 2008), eccentric force contributions (Nishiumi et al., 2023), sport/sex-specific jump profiles (Edwards et al., 2025; Picabea-Arburu & Ozaeta-Beaskoetxea, 2025), fatigue monitoring applications (Lourenço et al., 2023), and strength–jump relations (Park et al., 2024)—motivates our focus on jump height and EI in the present design: our instruments yield high-fidelity height outputs, whereas computing RSI/RSImod would have required contact-time or time-to-takeoff acquisition not captured in our protocol.

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However, the effective implementation of these monitoring strategies in university and semi-professional settings is often constrained by logistical and economic factors. While force platforms remain the gold standard, their lack of portability and high cost limit their daily utility courtside. In applied environments, field-deployable technologies such as infrared contact mats (IR-Mat) and smartphone-based video applications (e.g., My Jump) offer cost-effective alternatives to laboratory force platforms (Balsalobre-Fernández et al., 2015; Montalvo et al., 2021; Ríos-Gallardo et al., 2025).

A critical "Problem Statement" arises from the operational reality of competitive basketball teams: they often face scenarios where equipment availability varies—for instance, using a contact mat at a home training facility but relying on a smartphone app during travel or away games. If these devices do not yield practically equivalent values, longitudinal data becomes disjointed, leading to potential errors in fatigue detection and readiness assessment. While prior work shows that My Jump can provide valid and reliable estimates of CMJ height, devices differ in event detection and height calculation, which may introduce systematic differences in height. Consequently, agreement—not only correlation—must be established when considering interchangeability (Balsalobre-Fernández et al., 2015; Eythorsdottir et al., 2024; Gençoğlu et al., 2023; Stanton et al., 2019).

Therefore, we examined the concurrent validity and agreement between My Jump 2 and an infrared contact mat (IR-Mat) for SJ and CMJ height and EI in university basketball players. To address the gap in current knowledge regarding practical interchangeability, our approach necessitated a rigorous statistical framework beyond simple mean comparisons.Our a priori plan moved beyond association to quantify absolute agreement and error structure using ICC(2,1), Bland–Altman bias and 95% limits of agreement (with proportional-bias testing), typical error and CV, and two one-sided tests (TOST) for practical equivalence with pre-specified, field-relevant bounds (±2 cm for height; ±5% for EI) (Altman & Bland, 2017; Bland & Altman, 1986). Clarifying interchangeability at these margins can inform device selection and longitudinal monitoring without shifting decision thresholds.

Materials and Methods

Study Design

We conducted a single-center, single-visit, within-subject method-comparison study in a controlled indoor training environment. In one testing session, each participant performed standardized squat jump (SJ) and countermovement jump (CMJ) trials while performance was captured concurrently and independently by two field-deployable systems: My Jump 2 (smartphone video application) and an infrared contact mat (IR-Mat; MuscleLab, Ergotest Innovation AS). This simultaneous-acquisition design was selected to isolate device-related differences from day-to-day biological variability, enabling strict paired evaluations of bias, agreement, and practical equivalence. All procedures complied with the Declaration of Helsinki and were approved by the institutional ethics committee, the study protocol was approved by the School of Sport Organization. Written informed consent was obtained before participation.

Participants

Fourteen male university basketball players (n = 14) from the School Sport Organization, UANL program, volunteered to participate. Before enrollment, we explained the study purpose, procedures, and potential risks/benefits; athletes then completed a brief screening to confirm the absence of musculoskeletal pain or injury on the test day, followed by written informed consent. This sport-specific, relatively homogeneous cohort was selected to minimize between-subject variability that could obscure device-related differences in a paired design. Descriptive characteristics of the sample are presented in Table I.

Procedures

Anthropometrics and device profiling

Stature was measured with a wall-mounted stadiometer (SECA® 206, CE0123; Hamburg, Germany) and body mass with a calibrated digital scale. Consistent with manufacturers' guidance, we recorded leg length, 90° knee-flexion height, and lever arm to build each athlete's profile in My Jump 2 (Balsalobre-Fernández et al., 2015; Balsalobre-Fernández, Carlos, 2023). For the IR-Mat software profile, we entered demographic fields (date of birth, sex at birth, full name) and leg length to standardize data labeling and streamline export (Ergotest Innovation AS, n.d.). To characterize the cohort—rather than to calibrate either measurement system—we also collected body composition via bioelectrical impedance (Tanita®, Japan). This choice reflects our design priority: isolating device-related differences under matched conditions while avoiding additional model assumptions.

Warm-up and familiarization

Participants completed a standardized dynamic warm-up consisting of hip and knee flexion–extension drills (3 repetitions each), five partial squats to ~90° knee flexion, and five submaximal vertical jumps. Investigators then demonstrated SJ and CMJ with hands on hips and verified that each athlete could comfortably attain ~90° knee flexion. For testing, SJ was performed from a static ~90° knee-flexion position without countermovement; CMJ allowed a self-selected countermovement. All trials were executed with maximal intent while maintaining hands on hips throughout. Invalid attempts (loss of hands-on-hips, premature

countermovement in SJ, or clear technique faults) were immediately repeated. This sequence emphasized consistent mechanics to minimize technique-related variance and isolate device-related differences.

Instrumentation and recording set-up

My Jump 2 ran on an iPhone 14 Pro at 240 frames·s^{-1}, mounted on a tripod (Huawei® CF15 Pro) positioned 33 cm above the floor and 3.0 m from the athlete, perpendicular to the sagittal plane to optimize event detection and minimize parallax (Ríos-Gallardo et al., 2025).

The IR-Mat (MuscleLab, Ergotest Innovation AS) was placed on a flat, unobstructed surface following the manufacturer's instructions. The mat detects take-off and landing as interruptions of its infrared field and records flight time (FT) (Ergotest Innovation AS, n.d.). Consistent with field practice, both systems derived jump height from FT using the standard ballistic equation $h = g \cdot FT^2/8$, with $g = 9.81$ m·s^{-2}. The Elastic Index (EI) was then computed from device-specific heights as ([CMJ − SJ]/SJ) × 100 (Legaz Arrese, 2013). Because jump height is deterministically derived from FT, FT was not analyzed as a separate outcome.

This set-up provided simultaneous, independent data streams under identical mechanics, allowing analytic contrasts to isolate device-related differences rather than positioning or acquisition artifacts.

Trial structure and data handling

Participants performed multiple maximal trials per condition; for each device, we retained the best valid jump (highest height) for SJ and CMJ. Validity criteria mirrored the familiarization phase (hands on hips throughout, no countermovement in SJ, clear take-off/landing).

Raw outputs from My Jump 2 and the IR-Mat were exported, merged by subject identifier, and audited for transcription consistency. Before locking the dataset, we conducted visual diagnostics to flag anomalies—e.g., premature descent in SJ or atypical flight-time spikes—and resolved any issues according to the pre-specified validity rules. This workflow prioritized data integrity while preserving the paired, device-level structure required for unbiased agreement analyses.

Statistical Analysis

Analyses were performed in R (v4.5.0) (*Citing RStudio*, 2024). Descriptive statistics are reported as mean ± SD. Given the paired design, all contrasts were defined as My Jump 2 minus IR-Mat for each outcome (SJ height, CMJ height, and EI). Because jump height is deterministically derived from flight time, FT was not treated as a separate outcome. Systematic bias was tested with paired t-tests. Association between devices was quantified with Pearson's correlation. Absolute agreement was indexed using ICC(2,1) (two-way random-effects, single-measure, absolute agreement) with 95% confidence intervals. To characterize the agreement structure, we applied Bland–Altman analysis (mean bias and 95% limits of agreement) and evaluated proportional bias by regressing the paired difference on the paired mean (reporting slope and 95% CI). Error metrics included typical error (TE) derived from paired differences and the coefficient of variation (CV%) of the differences. Practical equivalence was assessed using two one-sided tests (TOST) with a priori bounds of ±2 cm for jump height (SJ, CMJ) and ±5% for EI; equivalence was inferred when both one-sided tests were significant at $\alpha = 0.05$ and the 90% CI for the mean difference lay fully within the bounds. All figures were produced with ggplot2, and agreement/equivalence procedures were implemented with standard R packages (e.g., psych/irr for ICC and Bland–Altman routines; TOST implemented via standard functions).

Results

Participant characteristics

The sample comprised a narrow, age-homogeneous cohort of male collegiate basketball players, which minimizes maturity-related confounding and supports within-cohort comparability. Mean stature and body mass indicate a physically robust group typical of university-level competition, while the relatively small dispersions (Table I) suggest similar training status across participants. Although the average body mass index (BMI) falls in the "overweight" range by general population cut-points, this likely reflects greater fat-free mass rather than excess adiposity in an athletic cohort; thus, BMI should be interpreted cautiously in this context. Collectively, these characteristics describe a fairly uniform, sport-specific sample—well suited to method-comparison aims—while also signaling that external generalization should be limited to male university players with comparable anthropometrics.

Table I. Descriptive Statistics of Participant Characteristics

Overall (N = 14)

Variable	Mean ± SD
Age (years)	18.8 ± 0.8
Body mass (kg)	86.3 ± 9.3
Stature (m)	1.82 ± 0.07
Body Mass Index (kg/m²)	26.12 ± 2.61

Values are **Mean ± SD**.

Between-method differences.

As summarized in Table II, My Jump 2 produced slightly higher jump heights than the IR-Mat (positive Δ, My Jump 2 − IR-Mat) for both SJ (+0.62 cm) and CMJ (+0.85 cm), yet the mean differences were small and not statistically significant. Linear associations were very large (r ≈ 0.95–0.97 for heights) and—crucially—absolute agreement was also high, with ICC(2,1) values in the 0.94–0.96 range for SJ and CMJ. Bland–Altman analyses showed small positive biases for jump heights with narrow limits of agreement, and error indices were modest (TE ≈ 0.9–1.5 cm; CV ≈ 3–4%), indicating that, at the group level, the two methods yield closely aligned height estimates. For the Elastic Index, My Jump 2 returned slightly lower values than the IR-Mat (Δ = −0.79%), with substantial association (r = 0.846) and high—though comparatively lower—absolute agreement (ICC(2,1) = 0.853), alongside greater dispersion (TE ≈ 4%; CV ≈ 30%), consistent with the behavior of a ratio-derived metric. Proportional-bias tests for height and EI were non-significant (p ≈ 0.24–0.98), indicating no clear magnitude-dependent differences. Overall, Table II indicates close concordance for jump height and acceptable—albeit noisier—agreement for EI.

Table II. Between-method comparison and agreement metrics (My Jump 2 vs IR-Mat)

All differences are expressed as My Jump 2 − IR-Mat; positive values favor My Jump 2

Outcome	n	Mean (MJ)	Mean (IR)	Δ (MJ−IR)	SD(Δ)	t	p	r	ICC(2,1) [95% CI]	TE	CV (%)	BA bias	LoA (low, high)	Slope	p(slope)
SJ height (cm)	14	30.69	30.06	0.62	1.20	1.94	0.074	0.972	0.962 (0.875, 0.988)	0.85	2.8	0.62	-1.72, 2.97	-0.0850	0.242
CMJ height (cm)	14	34.83	33.98	0.85	2.13	1.49	0.159	0.950	0.943 (0.833, 0.981)	1.51	4.4	0.85	-3.33, 5.03	0.0760	0.427
Elastic Index (%)	14	13.01	13.80	-0.79	5.74	-0.51	0.617	0.846	0.853 (0.606, 0.950)	4.06	30.3	-0.79	-12.04, 10.47	0.0047	0.978

Abbreviations: MJ = My Jump 2; IR = IR-Mat; BA = Bland–Altman; TE = Typical Error; CV = Coefficient of Variation.

Practical equivalence (TOST)

As summarized in Table III, the pre-specified equivalence bounds—±2 cm for jump height and ±5% for the Elastic Index (EI)—were met for all outcomes at the mean level. For SJ height, the 90% CI for the between-method difference (My Jump 2−IR-Mat) lay wholly within the bounds (0.06 to 1.19 cm; TOST $p = 0.0004$); likewise for CMJ height (−0.16 to 1.86 cm; TOST $p = 0.032$) and EI (−3.50 to 1.93 %; TOST $p = 0.008$). These results indicate that, within field-relevant decision limits, My Jump 2 and the IR-Mat can be used interchangeably to estimate mean SJ/CMJ height and EI without necessitating device-specific adjustments to team-level thresholds.

Importantly, this pattern—significant equivalence with non-significant NHST mean-difference tests—is expected and not contradictory: NHST addresses whether a difference exists, whereas TOST tests whether any difference is small enough to be practically negligible. Thus, Table III supports practical equivalence for the mean differences across devices, aligning with applied needs where maintaining consistent decision cut-offs (±2 cm for height; ±5% for EI) is paramount.

Table III. Equivalence testing (TOST)

Equivalence bounds: ±2 cm (SJ, CMJ); ±5% (Elastic Index). Differences are My Jump 2 − IR-Mat; 90% CI shown for mean differences.

Outcome	n	Mean diff (MJ−IR)	90% CI (low, high)	Equivalence bounds	p(lower test)	p(upper test)	TOST p (max)	Decision
SJ height (cm)	14	0.62	0.06, 1.19	[-2.00, 2.00]	0.0000	0.0004	0.0004	Equivalent
CMJ height (cm)	14	0.85	-0.16, 1.86	[-2.00, 2.00]	0.0001	0.0322	0.0322	Equivalent
Elastic Index (%)	14	-0.79	-3.50, 1.93	[-5.00, 5.00]	0.0083	0.0012	0.0083	Equivalent

Equivalence is concluded when both one-sided tests are significant at α = 0.05 and the 90% CI lies fully within the bounds. IR = IR-Mat

Bland–Altman Analysis

Figure I displays the method-difference structure for squat jump (SJ; panel A) and countermovement jump (CMJ; panel B) with differences expressed as *My Jump 2 − IR-Mat*. In both panels the mean bias is small and positive (green line), indicating a slight tendency for My Jump 2 to return higher heights than IR-Mat (SJ ≈ +0.62 cm; CMJ ≈ +0.85 cm). The point clouds are tightly clustered around the bias line with narrow 95% limits of agreement (red dashed lines; SJ ≈ −1.72 to 2.97 cm, CMJ ≈ −3.33 to 5.03 cm), and the scatter shows no

discernible trend across the x-axis (i.e., no evidence of magnitude-dependent or proportional bias), consistent with the nonsignificant slope tests reported in Table II.

Practically, the SJ dispersion is small relative to typical performance and well within a ±2 cm decision window for group monitoring; CMJ shows slightly wider dispersion—as expected for a larger-magnitude task—but still centers near zero with most observations comfortably inside the agreement bands. Taken together, Figure I indicates that between-method disagreement for jump height is low, unbiased, and largely homoscedastic, supporting the use of either device for monitoring mean SJ/CMJ height in this cohort (with formal equivalence confirmed in Table III).

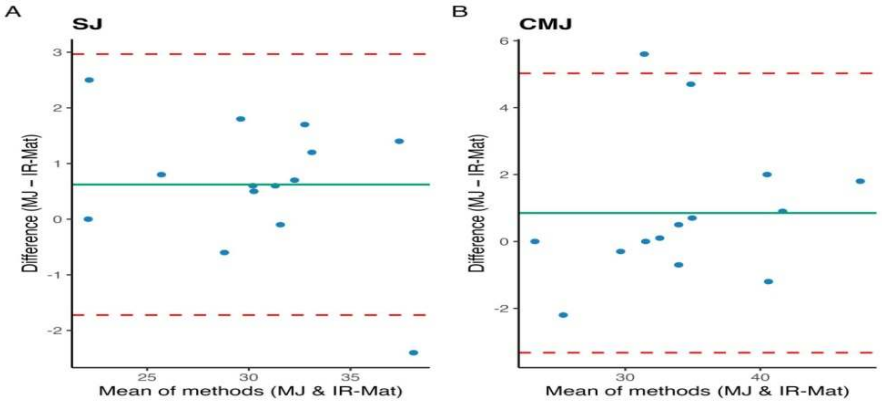

Figure I. Bland–Altman plots comparing My Jump 2 (MJ) with an infrared contact mat (IR-Mat) for (A) squat jump (SJ) and (B) countermovement jump (CMJ) heights in male university basketball players (n = 14). Differences are expressed as My Jump 2 − IR-Mat (cm). The solid line denotes the mean bias (SJ: +0.62 cm; CMJ: +0.85 cm); dashed lines denote the 95% limits of agreement (SJ: −1.72 to 2.97 cm; CMJ: −3.33 to 5.03 cm).

Identity Plots Interpretation

Figure II depicts the pairwise correspondence between My Jump 2 and IR-Mat for SJ (A) and CMJ (B). In both panels, data points cluster tightly along the line of identity ($y = x$), with minimal vertical scatter across the observed performance ranges (≈22–38 cm for SJ; ≈28–45 cm for CMJ). The cloud's near-unity slope and near-zero intercept indicate excellent linear correspondence and preserved rank-ordering between devices; the slight upward displacement of several points above the identity line mirrors the small positive bias quantified in Table II (My Jump 2 marginally higher than IR-Mat). There is no visual evidence of curvature or fanning, suggesting no meaningful proportional bias or heteroscedasticity across the range of jump heights. Practically, these plots support that either device yields comparable height estimates at the group level, while reminding that individual interchangeability should still be judged alongside the Bland–Altman limits of agreement (Figure I).

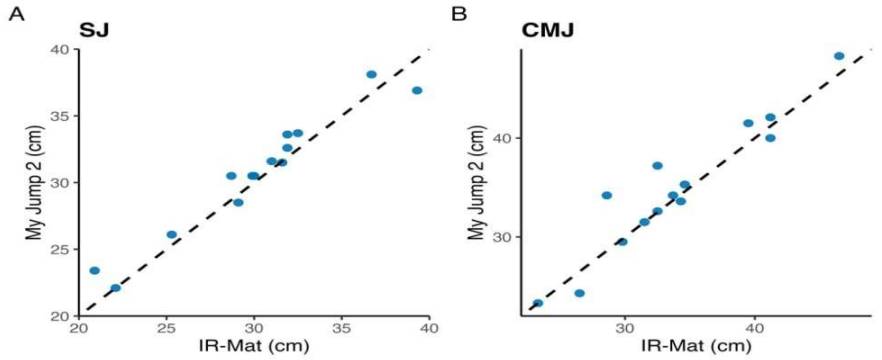

Figure II. Identity plots comparing My Jump 2 and IR-Mat for (A) squat jump (SJ) and (B) countermovement jump (CMJ) heights in male university basketball players (n = 14). The dashed line is the line of identity ($y = x$); tight clustering around this line indicates close between-method correspondence. Heights are expressed in centimeters.

Discussion

In this cohort of male university basketball players, My Jump 2 demonstrated concurrent validity and high absolute agreement with an IR-Mat for SJ and CMJ height. Between-method biases were small and positive (My Jump 2 − IR-Mat ≈ +0.6–0.9 cm), the 95% limits of agreement were narrow, and typical errors modest (≈0.9–1.5 cm), while associations were very large and ICC(2,1) values confirmed excellent absolute agreement. For the Elastic Index, the association remained substantial but dispersion was larger—expected for a ratio-derived metric. Crucially, TOST with a priori bounds (±2 cm for height; ±5% for EI) supported practical equivalence at the mean level across outcomes. Taken together, these findings indicate that, for group monitoring, My Jump 2 and IR-Mat can be used interchangeably for SJ/CMJ height, with greater caution warranted for EI and flight-time variables given their comparatively wider dispersion (and proportional tendencies noted for FT-SJ).

Our results align with and extend prior validations of the My Jump family against force plates and contact mats, which typically report near-perfect correlations and excellent agreement for jump height. In the original validation, My Jump vs. a force platform yielded r = 0.995 and ICC = 0.997 with a small Bland–Altman bias (~1.1 cm) for CMJ height—strong evidence of criterion validity under controlled conditions (Balsalobre-Fernández et al., 2015). Subsequent studies—including recent evaluations of My Jump 2 across different athlete populations—generally corroborate high validity and reliability for CMJ height, while noting that performance and agreement can shift with task constraints, surface, and analytic approach (Medeiros et al., 2024; Murawa et al., 2024; Soares et al., 2023). In parallel, a broader synthesis concludes that smartphone, flight-time–based methods are a cost-effective and accurate alternative for vertical jump assessment, albeit with validity bounded by the assumptions inherent to flight-time–derived height (Gençoğlu et al., 2023).

Our study adds applied, same-session evidence on concurrent validity against an infrared contact mat (IR-Mat)—a technology that detects flight time via interruptions of infrared beams and, like contact mats generally, converts flight time to height using standard kinematics (Marie Hilmersson et al., 2015). Beyond reporting correlation and ICC, we centered method-comparison principles—bias and 95% limits of agreement—as recommended for claims of interchangeability, and then complemented these with equivalence testing (TOST) to judge practical (not merely statistical) similarity within field-relevant bounds (Altman & Bland, 2017; Giavarina, 2015).

For applied sport science and coaching, the small biases and narrow limits of agreement for SJ/CMJ height indicate that either device can be used to track group-level changes in vertical jump performance with minimal risk of method-driven misclassification when decision thresholds are on the order of a few centimeters. The TOST results reinforce this reading by showing that any average between-device differences are trivially small relative to the pre-specified performance margin (±2 cm) (Schuirmann, 1987). By contrast, EI displayed greater variability—expected for a ratio metric—so teams should treat it as a contextual indicator rather than a primary KPI (e.g., apply rolling averages, require replicate trials, and interpret changes alongside height).

Our analysis followed best-practice method-comparison, reporting paired biases, 95% limits of agreement, typical error/CV, correlation, and ICC—a complementary set that speaks to different facets of validity and agreement (Bland & Altman, 1986; Giavarina, 2015). Crucially, we also implemented equivalence testing (TOST) rather than relying solely on null-hypothesis tests of mean differences: TOST asks whether any between-device difference is small enough to be practically negligible within a priori, researcher-defined bounds—the question that matters for interchangeability in applied monitoring (Ialongo, 2017; Schuirmann, 1987). In our context, those bounds were set to reflect field decision thresholds, ensuring that statistical inference mapped directly onto practical use.

Limitations and future directions. First, our sample comprised male university basketball players (N = 14); extrapolation beyond this sex, sport, and competitive level should be cautious. Second, both devices derive height from flight time; while this mirrors real-world practice, force-platform approaches based on take-off velocity can yield slightly different reference values, and reviews urge awareness of this distinction when interpreting validity (Gençoğlu et al., 2023). Third, the Elastic Index—being a difference/ratio metric—amplifies noise, which likely contributed to its larger dispersion; future work should evaluate multitrial averaging, replicate-day sampling, and other error-attenuation strategies for ratio-based outcomes. Fourth, despite rater training and tripod-based video capture, manual frame selection in My Jump 2 introduces potential operator variability, whereas IR-Mat outputs may be influenced by foot placement and beam geometry; we recommend standardized protocols and inter-rater checks when interchangeability is the goal. Finally, our equivalence bounds (±2 cm for height; ±5% for EI) were chosen for practical relevance; although consistent with common coaching thresholds, sport- and context-specific margins may be more appropriate in future studies focused on individual-level decisions.

Conclusions

In male university basketball players, My Jump 2 and an infrared contact mat (IR-Mat) show close agreement and practical equivalence for Squat Jump (SJ) and Countermovement Jump (CMJ) height. Our findings, supported by rigorous equivalence testing (TOST), demonstrate that any systematic bias between these

devices is negligible relative to field-relevant decision bounds (±2 cm). This supports the interchangeable use of either system at the group level for routine performance monitoring. By contrast, the Elastic Index (EI) and flight time metrics are usable but noisier—with magnitude-dependent differences observed in flight time for SJ—suggesting that individual-level decisions based on these derived variables should be interpreted with caution. Based on these results, we offer specific recommendations for strength and conditioning professionals working in university basketball contexts. First, regarding monitoring flexibility, coaches can confidently integrate both technologies into a unified monitoring program; for instance, an IR-Mat can be utilized for standardized testing at the team's home facility, while the My Jump 2 app can serve as a valid substitute during away games or training camps where transporting a mat is unfeasible. This flexibility allows for continuous data collection without creating "blind spots" in the athlete's longitudinal profile. Second, when switching between devices, coaches can maintain their standard decision thresholds for jump height (e.g., a change of >2 cm indicating meaningful fatigue or improvement), as the error between devices falls within this margin. Finally, concerning the Elastic Index, practitioners should exercise caution. While EI provides valuable insight into the utilization of the stretch-shortening cycle, its higher variability (Coefficient of Variation ≈ 30%) requires a nuanced approach. We recommend that practitioners do not base acute training modifications on small, day-to-day fluctuations in EI; instead, applying rolling averages or requiring multiple trial averages may help smooth out measurement noise to reveal true performance trends. This study contributes to the field by moving beyond simple correlation to establish practical equivalence, validating a cost-effective solution that democratizes high-quality monitoring for teams with limited budgets. Practically, this means coaches can track team trends in jump height with either device without shifting decision thresholds. Future work should extend these comparisons across sexes, sports, and competitive levels, incorporate force-platform, velocity-based references, and refine sport-specific equivalence bounds and decision thresholds that optimize sensitivity and specificity for applied athlete monitoring.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used Large Language Models (LLMs) in order to assist with grammatical correction only. After using this tool/service, the authors reviewed and edited the content as needed and took full responsibility for the content of the publication.

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Supplemental Material

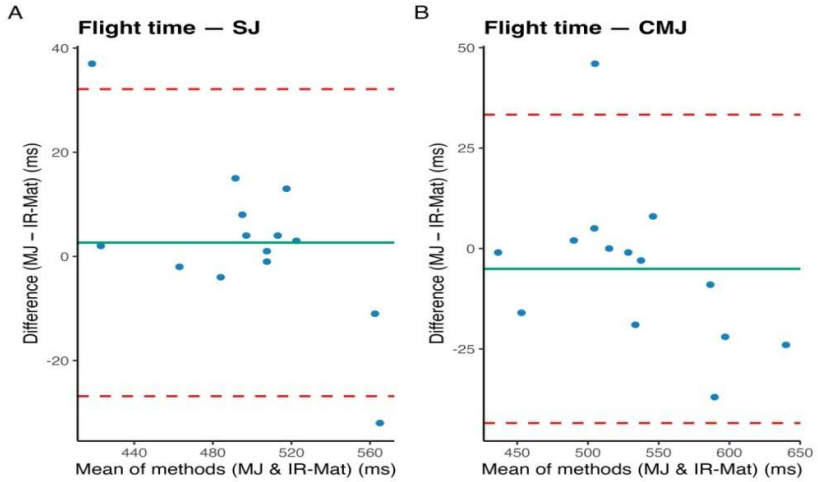

Figure S1. Bland–Altman plots for flight time in (A) squat jump (SJ) and (B) countermovement jump (CMJ). Differences are expressed as My Jump 2 (MJ) − IR-Mat (ms). Solid green line denotes the mean bias; dashed red lines denote the 95% limits of agreement. Patterns indicate small average differences but wider dispersion and evidence of proportional bias for FT-SJ.