FAST BREAK

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WELCOME TO FAST BREAK!

Welcome to FIBA's quarterly publication. Our goal is to introduce our FIBA Sport Medicine and Sport Science community to newsworthy research topics. We welcome your questions or comments and thank you for your ongoing commitment to FIBA.

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SELECTED PUBLICATIONS OF INTEREST

Prediction of male basketball players' adult stature from the age of 13 years using chronological age and maturity.

Pineau JC.

J Sports Med Phys Fitness. 2019 Apr;59(4):613-618.

PubMed link: https://www.ncbi.nlm.nih.gov/pubmed/30024128

BACKGROUND: The purpose of this study was to cross-validate and demonstrate how adult stature can be predicted in 13-year-old basket-ball players by using a new reference specific growth curve obtained from chronological age, and maturity of sedentary boys. METHODS: The prediction of adult stature of young male basketball players was established from the results of a longitudinal study in which we developed from 125 sedentary boys aged from 12 to 17.5 years new growth curves using chronological and biological maturation. In partnership with the French basketball federation, we collected information on stature, age and secondary pubertal stages from a sample of 106 boys aged from 160 and 164 months. The participants were regional level basketball players whose adult statures were known. The association of biological maturation at a chronological age was the determining criterion to predict individual adult stature with advanced, standard and delayed puberty. RESULTS: The average longitudinal growth curves enabled the prediction of adult stature within ±3 cm, 98% of the time in male basketball players. The relationship between estimated adult stature and final stature was high (r=0.98) with a low standard error estimate (SEE=1.65 cm). Mean and standard deviation of the differences between estimated stature and adult stature were 0.7±1.7. CONCLUSIONS: This technique is a valid, nonintrusive and accurate method of predicting adult stature in adolescent basketball players. It constitutes an advance in the detection and the orientation of future basketball players.

Effects of antisocial behaviour on opponent's anger, attention, and performance.

Ring C, Kavussanu M, Al-Yaaribi A, Tenenbaum G, Stanger N.

J Sports Sci. 2019 Apr;37(8):871-877.

PubMed link: https://www.ncbi.nlm.nih.gov/pubmed/30371145

Sledging, which is verbal antisocial behaviour in sport, aims to impair an opponent's performance. Previously, variations in performance have been attributed to changes in emotion and cognition. To improve our understanding of sledging, the current experiment examined the effects of verbal antisocial behaviour on anger, attention and performance. Participants performed a competitive basketball free-throw shooting task under insult (verbal behaviour designed to offend and upset the performer), distraction (verbal behaviour designed to draw attention away from the task), or control (neutral verbal behaviour) conditions. Performance was assessed by the number of successful baskets and a points-based scoring system, while anger and attention were measured post-task. The insult condition provoked more anger than the control and distraction conditions, whereas the insult and distraction conditions increased distraction and reduced self-focus compared to the control condition. Although verbal antisocial behaviour had no overall direct effect on performance, mediation analysis showed that anger indirectly impaired performance via distraction. Implications for the antisocial behaviour-performance relationship are discussed.

Influence of skill level on predicting the success of one's own basketball free throws.

Maglott JC, Chiasson D, Shull PB.

PLoS One. 2019 Mar 22;14(3):e0214074.

PubMed link: https://www.ncbi.nlm.nih.gov/pubmed/30901360

Basketball players sometimes claim to know when their shot is good, even before it goes in. This is likely because shooter proprioception can help determine shot outcome, even before their eyes confirm it. This phenomenon, however, has not been systematically explored for collegiate and recreational shooters. This study compared how well collegiate shooters and recreational shooters could predict outcomes of their own free throws without seeing the shot result. Forty collegiate and recreational shooters shot standard free throws while wearing liquid-crystal occlusion glasses that activated to occlude vision immediately following ball release during each shot. After each shot, shooters verbally predicted shot outcome as "in" or "out", and predicted results were compared with actual outcomes. As anticipated, for made shots, collegiate shooters more accurately predicted their own shots than recreational shooters. However, unexpectedly, for missed shots, collegiate shooters were worse than recreational shooters and were even significantly worse than chance. Further analysis found that collegiate shooters exhibited a significantly higher bias toward predicting their shots as "in". Understanding how shooters of different skill levels perceive their own shot could inform future training strategies for improving shooter accuracy.

Long-Term Analysis of Elite Basketball Players' Game-Related Statistics Throughout Their Careers.

Lorenzo J, Lorenzo A, Conte D, Giménez M.

Front Psychol. 2019 Feb 27;10:421.

PubMed link: https://www.ncbi.nlm.nih.gov/pubmed/30873096

The aim of the present study was to analyze the changes of game-related statistics in expert players across their whole sports careers. From an initial sample including 252 professional basketball players competing in Spanish first division basketball league (ACB) in the 2017-2018 season, 22 met the inclusion criteria. The following game-related statistics were studied: average points, assist, rebounds (all normalized by minute played), 3-point field goals percentage, 2-point field goals percentage, and free throws percentage per season. Each variable was individually investigated with a customized excel spreadsheet assessing individual variations and career trends were calculated. The results showed a positive trend in most of the investigated players in assists (91% of cases) and free throw percentages (73% of cases). Similar percentages of positive and negative trends were observed for all the other game-related statistics (range: 41-59% for negative and positive, respectively). In conclusion, an increase in assist and free throw performance was shown in the investigated players across their playing career. This information is essential for basketball coaches suggesting the use of most experienced players in the final moments of the game.

Well-Come Back! Professional Basketball Players Perceptions of Psychosocial and Behavioral Factors Influencing a Return to Pre-injury Levels.

Conti C, di Fronso S, Pivetti M, Robazza C, Podlog L, Bertollo M.

Front Psychol. 2019 Feb 8;10:222.

PubMed link: https://www.ncbi.nlm.nih.gov/pubmed/30800089

The psychological factors influencing a return to sport has gained increased research attention. In the current investigation, we explored professional basketball players' perceptions of the psychosocial and behavioral factors facilitating a return to performance equal to or exceeding previous performance standards. We also sought to describe athletes' experiences - both positive and negative - of returning to sport following injury recovery. Ten Italian professional male basketball players (age range 22-36 years), were retrospectively interviewed in relation to three time-periods: (1) from the commencement of rehabilitation to their first official competition, (2) the first official competition, and (3) the 6-months following the initial competition. Qualitative content analysis of the data revealed numerous themes across the three time periods. In regards to Period 1, participants indicated that social support, investment in rehabilitation and training programs, coping skills and motivation were fundamental in reaching pre-injury performance levels. During their first official game (i.e., Period 2), athletes reported that realistic performance expectations, focusing on the performance, positive emotions, motivation, arousal and social support facilitated their return to sport. Athletes, however, also described a predominance of factors that hindered their return to pre- injury levels (i.e., low confidence in personal abilities, decrements in skill execution and dysfunctional physical sensations). Moreover, participants typically described a substandard level of performance during their first competition back following injury. In recounting experiences during the 6 months following their first official game, basketballers reported improvements in skill execution and highlighted the importance of coping skills, motivation and social support. The process of restoring self-confidence in one's ability to successfully perform was perceived as crucial in enabling participants to move beyond a mere return to sport to a return to high performance - that is, to reach a level of proficiency equal to or exceeding previous performance standards. Findings support the relevance of cognitive, emotional and behavioral responses highlighted in the Integrated Model and suggest the importance of addressing psychological factors throughout the return-to-sport process. Finally, results from the present study hold a number of practical implications for athletes' aiming to achieve a return to pre-injury levels.

Training and Competition Load Monitoring and Analysis of Women's Amateur Basketball by Playing Position: Approach Study.

Reina Román M, García-Rubio J, Feu S, Ibáñez SJ.

Front Psychol. 2019 Jan 9;9:2689.

PubMed link: https://www.ncbi.nlm.nih.gov/pubmed/30687163

Currently, the number of women involved in sport is increasing. Although, research on their characteristics and performance is scarce. A great amount of research on men's basketball is available, but it is unknown if it can be applied to women's basketball. The objective of this research was to characterize the internal and external load performed by female basketball players during training and sports competition according to playing positions through inertial devices. The participants in the following study were 10 amateur basketball players

who competed at regional level (21.7 ± 3.65 years; 59.5 ± 12.27 kg, and 168.5 ± 3.56). Data were collected in games of the final phase (n = 8) and from 5 vs. 5 training tasks (n = 47). All the analyses were run according to playing positions. Each player was equipped with a GarminTM Heart Rate Band and WimuTM inertial device that monitored physical activity and movement in real time. The results obtained showed that the load experienced during competition was significantly higher ($p < 0.001$) than during training (Heart Rate, Player Load, Steps, Jumps, and Impacts). There were also differences according to playing positions, mainly between the backcourt and frontcourt players ($p < 0.001$). The players must work in higher areas of heart rate during training, mainly in Z4 and Z5, increasing their HRmáx y HRavg. The training doesn't equal the load supported and the distance performed in competition, so it is necessary to pay more attention during training. This information allows us to develop adequate training protocols adjusted to the specific individual requirements of the sports competition.

Impact of Positive and Negative Motivation and Music on Jump Shot Efficiency among NAIA Division I College Basketball Players.

Boolani A, Lackman J, Baghurst T, Larue JL, Smith ML.

Int J Exerc Sci. 2019 Jan 1;12(5):100-110.

PubMed link: https://www.ncbi.nlm.nih.gov/pubmed/30761206

The objective of this study was to determine whether music, positive feedback, and/or negative feedback impacted jump shooting performance in NAIA Division I male and female basketball players. Using a cross-over design, participants (N=20) took 50 shots from 15 feet and 50 shots from the 3-point line under four conditions (silence, music, positive feedback, negative feedback). The number of shots made were recorded and a one-way ANOVA was used to determine differences between gender. Repeated measures ANOVAs were used to determine differences between conditions in shooting performance and to identify differences in gender by condition. Analysis yielded no significant ($p>.05$) differences between gender or gender by condition. However, significant differences ($p<.05$) between conditions were noted, as participants had better shooting percentages in silence and music conditions compared to positive and negative reinforcement for shots from 15 feet. Participants also had better shooting percentages in the music condition compared to negative and positive feedback. Silence and music yielded significantly better shooting percentage compared to positive and negative feedback; however, these conditions did not necessarily mimic in-game conditions. Further research must be conducted on player performance during game time situations with negative and positive feedback from the crowd (i.e. home crowd versus away crowd).

Basketball Game-Related Statistics that Discriminate Between European Players Competing in the NBA and In the Euroleague

Paulauskas R, Masiulis N, Vaquera A, Figueira B, Sampaio J.

J Hum Kinet. 2018 Dec 31;65:225-233.

PubMed link: https://www.ncbi.nlm.nih.gov/pubmed/30687434

This study aimed to identify the game-related statistics that discriminated between Euroleague basketball players and European basketball players playing in the NBA, when competing in the same event (EuroBasket 2015). There was a total of 78 matches played by 24 teams in two groups of analysis: NBA, participants in the European Championship who played in the NBA season of 2014-2015 (n = 26); Euroleague, participants in the

European Championship who played in the Euroleague season of 2014-2015 (n = 82). The players' performance variables were normalized to the time they spent on the court. To identify which variables best discriminated between the NBA and the Euroleague performance profiles, a descriptive discriminant analysis was conducted. Structure coefficients (SC) from the matrix greater than |0.30| were interpreted as meaningful contributors to discriminating between the groups. The results revealed a significant function ($p = 0.008$, canonical correlation of 0.51, $\Lambda = 0.74$, reclassification = 84.2%) and substantial performance differences in game-related statistics much related to the influence of body size (body height and mass), such as two-point field goals made (SC = 0.42) and missed (SC = 0.40), free-throws made (SC = 0.55), defensive rebounds (SC = 0.62), blocks (SC = 0.48) and suffered fouls (SC = 0.34). No differences were found at the level of game-related statistics indirectly related to perception, such as assists, turnovers or steals. Also, the greater body size in NBA players was likely related to higher variability in performance, thus, being an important topic for coaches and recruiters to analyse.

Salivary BDNF and Cortisol Responses During High-Intensity Exercise and Official Basketball Matches in Sedentary Individuals and Elite Players.

Moreira A, Aoki MS, de Arruda AFS, Machado DGDS, Elsangedy HM, Okano AH.

J Hum Kinet. 2018 Dec 31;65:139-149.

PubMed link: https://www.ncbi.nlm.nih.gov/pubmed/30687426

Salivary cortisol increases in response to stressors, including physical exertion and psychological stress associated with sports competition. In addition, stress may induce change in brain-derived neurotrophic factor (BDNF). However, there are still no data available to compare the salivary BDNF level in sedentary male individuals and elite team-sport male athletes, regularly involved in activities that require elevated attention and concentration. This information could contribute to the advance of understanding of the effect of regular exercise on the salivary level of BDNF, the pre-to-post change in salivary BDNF during exercise, and the association between salivary cortisol and salivary BDNF responses to physical exercise. Therefore, this study aimed to compare the concentration of salivary cortisol and BDNF, before and after exercise, in sedentary individuals and elite male basketball players. The sedentary group (23.0 ± 4.2 yrs) performed a high-intensity exercise protocol and the basketball players (18.6 ± 0.5 yrs) participated in three official basketball matches. Saliva samples were tested for cortisol and BDNF using ELISA. A significant increase in salivary cortisol from pre- to post-match was observed only for the basketball players ($p < 0.05$). Basketball players also presented a higher salivary BDNF concentration for both resting (pre) and post-physical exercise ($p < 0.05$); however, no change in pre- to post-exercise salivary BDNF was observed for either group ($p > 0.05$). Elevated BDNF in athletes may be associated to their repeated exposure to stressful competition situations. The current findings also suggest that different mechanisms might be involved in salivary cortisol and BDNF responses during physical exercise.

Epidemiology of sports injuries in basketball: integrative systematic review.

Andreoli CV, Chiaramonti BC, Buriel E, Pochini AC, Ejnisman B, Cohen M.

BMJ Open Sport Exerc Med. 2018 Dec 27;4(1):e000468.

PubMed link: https://www.ncbi.nlm.nih.gov/pubmed/30687514

INTRODUCTION: Basketball is a contact sport with complex movements that include jumps, turns and changes in direction, which cause frequent musculoskeletal injuries in all regions of the body. OBJECTIVE: This is an integrative systematic review of the epidemiology of musculoskeletal injuries in basketball. METHODS: This is an integrative review based on the following sources of information: PubMed/MEDLINE, Embase, LILACS, BBO-Biblioteca Brasileira de Odontologia, IBECS-Índice Bibliográfico Espanhol em Ciências da Saúde, nursing journals, dental journals and core clinical journals in the last 10 years with studies addressing the general epidemiology of sports injuries in basketball. RESULTS: In total, 268 articles were selected, of which 11 were eligible for the integrative review. A total of 12 960 injuries were observed, most of which occurred in the lower limbs (63.7%), with 2832 (21.9%) ankle injuries and 2305 (17.8%) knee injuries. Injuries in the upper limbs represented 12%-14% of the total injuries. Children and adolescents received head injuries more often compared with the other age and skill categories. In the adult category, there was an increased prevalence of injuries in the trunk and spine. In the upper limbs, hands, fingers and wrists were affected more frequently than the shoulders, arms and forearms. In the masters' category, there was an increase in the incidence of thigh injuries. CONCLUSION: The lower limbs were the most affected, with the ankle and knee joints having the highest prevalence of injuries regardless of gender and category. Further randomised studies, increased surveillance and epidemiological data collection are necessary to improve knowledge on sports injuries in basketball and to validate the effectiveness of preventive interventions.

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