

last three decades. Most of the included studies (n=196, 74%) presented a follow-up duration of at least 2 years (range 6 months to 27 years). The proportion of male to female participants increased by 10% over the last three decades- 1990s (32%) to 2010s (42%).

Conclusion: This review revealed that IKDC, Lysholm, Tegner and KOOS were the most frequent measures of function in longitudinal ACL studies. Although most studies reported a follow-up duration of longer than 2 years, almost a quarter had a follow-up duration of less than 1 year. Despite the proportion of female participants in the included studies increasing over the last 30 years, more male than female participants continue to be included in longitudinal ACL studies.

Impact/Application to the field: The results of this study can guide clinicians and researchers towards outcome measures more frequently used in longitudinal studies following ACL injury to aid in the standardisation of ACL research and further inform the effectiveness of treatment following this debilitating but common injury.

Conflict of Interest: My co-authors and I acknowledge that we have no conflict of interest of relevance to the submission of this abstract.

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(P100089)

Barefoot running (BFR): Revisiting an old trend

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Introduction: Despite the technological developments in modern running footwear, up to 79% of runners today get injured in a given year. Running barefoot is not a new concept; yet relatively few people choose to run barefoot (BF) on a regular basis. While benefits have been suggested, there are potential risks associated with running BF. The purpose of this presentation is to identify and summarize the up-to-date evidence-based knowledge concerning barefoot/minimal footwear running and their implications.

Methods: A literature search of MEDLINE, PEDro, EMBASE and the Cochrane data base CINAHL (from their inception – May 2022) was conducted using the following search terms: "barefoot running" and "barefoot running biomechanics".

Results: 84 relevant articles were found. Most were reviews, biomechanical and kinematic studies.

Conclusion: The studies that have looked at the barefoot condition have found notable differences in gait and other parameters. These findings, along with much anecdotal information, can lead one to extrapolate that barefoot runners should have fewer injuries, better performance, or both. Several athletic shoe companies have designed running shoes that attempt to mimic the barefoot condition and, thus, garner the purported benefits of barefoot running. Although there is no evidence that neither confirms nor refutes improved performance and reduced injuries in barefoot runners.

Impact:

- Many of the claimed disadvantages to barefoot running are not supported by the literature.
- barefoot running may be an acceptable training method for athletes and coaches who understand and can minimize the risks.

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Kinesiotaping (KT) in musculoskeletal conditions: the myths and facts

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Introduction: The use of the kinematic tape (KT) has become common in recent years in the treatment of skeletal injuries for the purposes of: pain reduction, increased range of motion, improved joint stability and more. Few studies have been written on the subject, and opinions differ as to the efficacy of KT compared with other interventions in physiotherapy

Purpose: Review the evidence and validity of KT tape being an efficient method of physiotherapy compared to other interventions.

Methods: A literature search of MEDLINE, PEDro, EMBASE and the Cochrane data base CINAHL (from their inception – May 2022) was conducted using the following search terms "kinesiotape", "musculoskeletal"

Results: 112 reviews and articles were found, of which 47 relevant studies were included in this review. Results were divided according to body regions.

Conclusion: KT is a treatment method whose effectiveness is questionable in the treatment of skeletal injuries. There is partial evidence of short-term pain relief, improved flexibility and improved muscle electrical activity. The KT is part of a wide range of treatments for skeletal injuries and should be carefully and specifically applied for treatment.

Impact:

- It is not possible at this stage to recommend the wide use of KT in musculo-skeletal conditions
- KT has no better effect than any placebo tape in the treatment of musculo-skeletal conditions

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Referent weight-bearing values and distribution patterns in walking, ground, treadmill and elliptical jogging: An original research study

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Introduction: Sports physicians are frequently required to decide on patient weight-bearing limitations following certain bony or soft tissue injuries as well as lower-limb surgical procedures. The purpose of this presentation is to provide researched data regarding the average percentage body weight (APBW) values and weight-bearing distribution patterns (WBDP) between four common leisure and sports activities in a referent adult population and to suggest clinical implications.

Methods: An innovative weight-bearing system gait analysis system (SmartStep™) was utilized in this study. Asymptomatic

subjects (N= 78, mean age, 33.4y; range 19-72y) were included. The subjects participated in four tests: I. Ground walking over a 20 m distance, II. Ground jogging over a 20 m distance, III. Treadmill jogging at a constant speed of 8.5 km/hr for a 15-second interval and IV. Elliptical jogging over a 20 second period at a resistance and incline level of 10, and at a steady pace within the range of 70-95 steps/min.

Results: In walking tests, the APBW value on the entire foot value was 112% (SD=15.57), 80% (SD= 15.92) on the hind foot, and 108% (SD= 15.47) on the forefoot. In ground jogging, the APBW value on the entire foot was 201% (SD= 31.24), 101% (SD= 21.78) on the hind foot, and 174% (SD=28.52) on the forefoot. In the treadmill test, the APBW value on the entire foot was 175% (SD=25.48), 88% (SD=24.86) on the hind foot, and 146% (SD=25.59) on the forefoot. In the elliptical test, the APBW value on the entire foot value was 73% (SD=13.8), 33% (SD= 13.7) on the hind foot, and 48% (SD= 15.9) on the forefoot.

Conclusion: Elliptical training significantly reduces weight-bearing as compared to other common functional and sporting activities.

Impact:

- Elliptical training can be used in cases where weight bearing needs to be reduced
- Early rehabilitation can be commenced early on in rehabilitation to prevent muscle atrophy and maintain cardio-pulmonary function

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Influence of a nonlinear pedagogy approach on individual routes of learning when acquiring a complex weightlifting skill

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Introduction: Traditionally, reducing performance variability is synonymous with 'optimal' skill learning, however, contemporary skill acquisition approaches, such as Nonlinear Pedagogy (NLP), view variability differently. Exploration (i.e., movement variability) of alternative movement patterns, even those considered suboptimal, are thought to be important in learning, facilitating the development of adaptable and individualised movement solutions (Chow et al., 2022). This exploratory study aimed to describe the individual dynamics of performance related to the level of movement exploration when learning the power clean skill using a NLP approach.

Methods: Four healthy adults, categorised as weightlifting beginners (Everett, 2012), practiced the power clean over 7 sessions for 4-weeks. Consistent with NLP design principles, analogy-based instructions were used to avoid explicit technique prescription (Komar et al., 2014) and two task constraints (poles in front of lifter and chalk on barbell; Verhoeff et al., 2018) were introduced in sessions 2-5 to infuse practice variability and encourage movement exploration. Sessions comprised a warm-up of 1×5 repetitions (20kg barbell), followed by 3×5 repetitions (30kg barbell) recorded using 3-D motion capture to track 36 retroreflective markers to create nine time-continuous variables. Cluster analysis quantified individual movement to provide an exploration/exploitation ratio (EER). Exploration occurred when movement clusters differed between

two repetitions and exploitation occurred when movement on repetitions was the same (Komar et al., 2019). To quantify performance changes, horizontal barbell displacement was measured from start position to final catch position (B×D) (Winchester et al., 2005).

Results: Individual differences in movement exploration across sessions were apparent. Lifter A demonstrated the least exploration (EER = 0.07 – 1.8) and largest improvement in B×D early in practice (S1 to S3 = 14.40%). Lifter B explored most in S4 and S5 (EER = 2.75 – 4) and showed minimal changes in B×D across sessions (S1 to S7 = -2.39%). Lifter C demonstrated high levels of exploration across all sessions (EER = 1.14 – 3.66) and improved B×D later in practice (S5 to S7 = 9.23%). Lifter D explored most in session 4 (EER = 6.50) and displayed largest improvement in B×D between S1 to S3 (5.12%).

Discussion: NLP-designed practice had different impacts on performance dynamics and levels of exploration for lifters. All lifters demonstrated improved performance outcomes, but displayed different routes of learning (Kostrubiec et al., 2012). Some learners (i.e., Lifter C) may display more exploration to discover a functional, stable performance solution (Bifurcation route). Other learners (i.e., Lifter A) may display less exploration while gradually transitioning between movement patterns (Shift route). Practical implications include how explicitly prescribing an "ideal" technique may not be necessary to achieve optimal performance, with NLP-designed practice potentially facilitating the development of individualised movement patterns matched to individual capabilities.

Impact and application to the field: Findings challenge a "one size fits all" approach, indicating that skill development is highly individualised and movement variability is not necessarily "poor performance", but may represent a beneficial exploratory component of the learning process.

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Risk factors for the development of femoroacetabular impingement in physically demanding occupations: a systematic review

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Background: Femoroacetabular impingement (FAI) syndrome, or hip impingement, is a musculoskeletal condition affecting the hip joint. It involves motion- or position-related pain originating from an abnormal, premature contact between the femoral head-neck junction (femur) and the acetabular rim (rim around the hip socket). Cumulative and repetitive mechanical overloads at the hip joint appear to contribute to the development of FAI. However, occupational exposures to such loads in potential high-risk occupational groups (e.g., military personnel and athletes) and the relationships between these exposures and the development of FAI remain unclear. Therefore, the aim of this review was to identify and synthesise findings from studies which have reported on the occurrence rates and risk factors between occupations or occupational tasks in physically demanding occupations, and the development of FAI.

Method: This review was conducted according to the PRIMSA-P guidelines and registered on the Open Science Framework. PubMed, EBSCO, Scopus, Web of Science, CINAHL and ProQuest databases