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ROLE OF STATIC AND DYNAMIC STRETCHING EXERCISES IN IMPROVING BALANCE AND FLEXIBILITY, IN FEMALE ATHLETE PLAYERS: A REVIEW

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Abstract:
Static Stretching hurts movement time, agility, and balance. Should the training module or game incorporate exercises involving balancing and sudden direction changes while running, the DS protocol may be a better fit than the SS protocol. Considering our results, physical education instructors and coaches could revaluate using SS before a game, since quick movements of the upper limbs and agility are essential for success Dynamic stretching is the most commonly suggested warm-up protocol.
The DS technique involves a stretch to lengthen the muscle, and it is performed by moving parts of the body and gradually increasing the reach and speed of movement. It often mimics movement patterns performed during subsequent exercise. DS provides a more sport-specific warm-up exercise, and as a precursor, it increases body temperature, improves nerve conduction, and increases sports performance. However, reports regarding the effect of DS on muscle stiffness are conflicting, indicating that DS may cause increased or reduced muscle stiffness. The core muscle strengthening may help improve dynamic balance and coordination between lower and upper extremities, as well as reduce injury risk and muscle imbalance.

Keywords: Static stretching, Dynamic stretching, balance, flexibility, warm up, cool down

Introduction:

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Aim and objective: In this study, we examine the role of Static & dynamic stretching exercises in improving balance and flexibility in female athlete players. We want to decrease the injury that can held due to balance & flexibility in female athlete players.

To improve joint ROM, many physical activities involve stretching. Stretching has other immediate advantages for the neuromuscular system. If increasing joint range of motion and improving muscular force and/or power are the goals of a warm-up, then DS appears to be a

good alternative to static stretching. Nevertheless, some research has found possible mitigating factors (e.g., stretch time, amplitude, or velocity) that have no impact on performance or even exacerbate it. Consequently, ballistic stretching would not be preferred over controlled dynamic stretching, which is a type of dynamic stretching with higher velocities. (1)

The dynamic stretching protocol should be viewed as the subjects' preferred, self-selected warm-up technique since it was selected following an examination of the warm-up exercises, they completed prior to regular training sessions. The five active dynamic exercises in the dynamic stretch protocol were created to imitate certain aspects of the sprint cycle and to dynamically stretch the lower-body muscles that are mostly employed in sprinting. Every exercise was carried out over a 20-meter walking distance. For every workout, the movements were performed roughly fourteen times. The subjects were randomly selected, and each leg experienced 1, 2, or 3 sets of dynamic stretch conditions. Between each set, you rested for ten seconds before returning to the beginning position. Throughout the ADS exercises, the participants were consistently told to keep their torsos vertical and their knees pressed up against their chests. The stretching regimen employed by Pearce et al. served as the foundation for the active dynamic stretches (2)

Dynamic stretching may have an impact on the biomechanical as well as physiological characteristics of the muscle-tendon unit (MTU) and/or any of its constituent parts, including tendon or muscle stiffness and overall joint mechanics. This could therefore change physiological factors that affect running economy and endurance performance, such as lactate threshold, oxygen uptake, and VO2 kinetic responses. (3)

Badminton is the sport where Achilles tendon ruptures occur most frequently. Stretching and wearing heels higher have been suggested as ways to reduce the incidence of these injuries, which can be exacerbated by tight and cramped muscles. However, there is no proof that badminton players actually have short, tight calf muscles or that stretching as part of a training regimen will lengthen the muscles or increase the ankle's range of dorsiflexion. A number of strategies, including strength and conditioning, static stretching, appropriate use of safety gear, warm-up as well as cool-down before and after exercise, and landing approach, are used to prevent sports injuries. Programs for preventing sports injuries are offered to prevent and lower the risk of sports injuries. (4)
To improve your badminton mobility, particularly your COD performance, it makes sense to work on your balance. The impact of combined plyometric and balance training on juvenile soccer players and professional female basketball players has been studied in the past. In comparison to a single plyometric intervention, the results indicated that a combination program could result in higher performance improvements in balance, power, and COD. On the other hand, it was proposed that the plyometric exercise adaptations can be jeopardized by immaturity or a lack of appropriate balancing abilities.(5)
Stretching has been utilized for years to improve ROM around a joint and is a common practice in physical activities. There are additional immediate benefits of stretching for the neuromuscular system. Researchers developed an interest in alternate stretching strategies after finding statistically significant decreases in either maximal voluntary strength, muscle power, or evoked contractile properties after a single static stretching session.(6)
• Muscular flexibility is the capacity of a muscle to extend, allowing one joint or a series of joints to move through a ROM. For non-athletes, hamstring flexibility is crucial in preventing knee injury. The connection between hamstring injury and flexibility has been studied by a number of writers, including Christensen C, et al (1972). Research by Liemohn (1978) and

Worrell et al. (1991) found that persons with hamstring injuries were less flexible than those without injuries. The hamstring is a crucial lower limb muscle that supports knee flexion and hip extension. Walking involves the hamstrings actively from "the end of the swing phase until the foot flat is reached, according to Mann and Sprague (1980). During the swing phase, the hamstrings contract eccentrically to regulate knee extension. At heel strike, it begins the flexion of the knee and offers stability. Running causes the hamstring muscle to contract in the last third of the swing phase when the tibia decelerates eccentrically and the hip flexes concentrically. It has been" documented that static stretching can be used as a therapeutic technique to treat sports injuries as well as prevent problems related to a lack of flexibility. (7)

Material and Method: Google Scholar, Pub Med, the Physiotherapy Evidence Database, and the Cochrane Database were used to search electronic databases for titles and abstracts. The review included only full-text papers, which were double-checked to determine the role of static & dynamic stretching exercises in improving balance and flexibility in female athletic players. This study was ethically approved by ethical committee (BMU/FTP/202). Google Scholar, Pub Med, the Physiotherapy Evidence Database, and the Cochrane Database were used to search electronic databases for titles and abstracts. The review included only full-text papers, which were double-checked to determine the role of static & dynamic stretching exercises in improving balance and flexibility in female athletic players.

Avi Saraswat and Deepak Malhotra. (2015) researched to enhance balance and so lower the chance of injury; for instance, basketball players frequently tear their ligaments. A variety of drills are employed to enhance performance metrics including agility. Pairwise t-tests and independent tests were employed to analyze the data for the within-group analysis and the between-group analysis, respectively. The control group's T-test times did not decrease, but the experimental groups were significantly shorter. According to Behm D.G. and Caoutchin (2011), a sizable number of articles have been published that show no negative consequences from previous static stretching. Numerous factors could be connected to the absence of impairment. These consist of brief static stretching (less than 90 seconds overall) at a stretch intensity below pain. The kind of performance exam used on a middle-aged, highly trained, or competitive athlete group is another determinant. Static stretching may even be helpful in some situations, such as slower velocity eccentric contractions, longer-lasting contractions, or cycles of shorter stretches. Short-duration, low-intensity static stretches are recommended for a trained population participating in sports that demand a high level of static flexibility to reduce. Dimitris Chatzopoulos, Christos Gigajoules, Dimitrios Partikas, Christos Catsimatidis, (2014)This research investigated the immediate impact of three distinct stretching protocols on response time, agility, balance, and upper limb movement time. 31 female athletes from high school took part (age = 17.3 ± 0.5 years). Each participant completed one of the following protocols on different days: (a) jogging for three minutes and then stretching for seven minutes (static stretching; (b) jogging for three minutes and then stretching for seven minutes (dynamic stretching); or (c) jogging for three minutes and then resting for seven minutes (NS). Dynamic balance, reaction time (the amount of time between hearing a sound stimulus and releasing a button), movement time (movement of the upper extremities over a 0.5 m distance), and the 505-agility test were among the tests that participants underwent in accordance with the protocols. To prevent spillover effects, the sequencing of performance testing and stretching methods was reversed. Repetitive measures ANOVA revealed significant primary impacts for all variables except reaction time. With the DS protocol, movement time, agility, and balance were all improved over the SS protocol. Additionally, in terms of agility, the DS protocol performed better than the NS protocol. The study's findings indicate that DS protocols are

preferable to SS protocols for tasks requiring balance, agility—the ability to change direction quickly—and upper-extremity movement time. Static stretching was less successful than dynamic stretching in lengthening the upper limbs' range of motion.
Smith DT and Herman SL. 2008. The study compared "the effects of a static-stretching warm-up (SWU) and a dynamic-stretching warm-up (DWU) intervention on power, speed, agility, endurance, flexibility, and strength performance measures in collegiate wrestlers over a four-week period. Before beginning their daily preseason exercises, twenty-four male Division I wrestlers from the National Collegiate Athletic Association were randomized to either an active control condition (SWU; n = 13) or a 4-week treatment condition (DWU; n = 11). Before and after the four-week experimental phase, anthropometric and performance measures (i.e., DWU or SWU) were given.

Discussion:

This study evaluated the available data supporting the use of role & effectiveness of static & dynamic exercises in improving balance & flexibility in female athlete players program therapy to decrease risk of injuries, increases core strength, increase balance, flexibility, agility, effect on good performance. This review's objective was to analyse how exercise helps in female athletes performance and quality of life as well as game improve with the help of good blanace and good flexibility. Every study that was part of this evaluation looked into how exercise therapy may help exercises to decrease risk of injuries with good balance and good flexibility, increases core strength, increase agility, effect on good performance.
Following a program of core stabilization training, (Sato and Mokha) also assessed the dynamic postural control and performance of recreational and competitive runners. Even while the core-stabilization training group outperformed the control group by an average of 5000 meters, the improvement did not reach statistical significance for SEBT directions after six weeks. Rather, they saw an important exchange. More stability in the base might result in more constant movement control, yet it was unclear how this enhancement might speed up running or avoid injuries.

Aggarwal et al. compared a core stabilization-training program with a balance-training program in subjects who participated in leisure activities using the SEBT. Improvement was also noted in the anteromedial and medial directions. Because of the contraction of the local muscles, as opposed to the global muscles that are recruited during lower extremity movement, resulting in improved control over the trunk and center of gravity, this was explained. Additionally, they had the most progress in the medial direction. Due to enhanced proprioception and improved static control of the ankle muscles, the balance-training group also saw improvements in reach directions. Dynamic postural control was found to have improved in other studies involving athletes. Comparing tennis players to a group of non-athletes, Samson et al. found this.
Therefore, the 12-week training program consisting of dynamic stretching exercises and dynamic balancing exercises cannot be held responsible for any significant improvement in posttest differences in times on the SEBT, SRT, or SLST.
According to Rajiv Sighamoney, Raika Kad and Ujwal L Yeole 30 badminton players between the age 10-19 years (mean age14+) were selected and informed consent was taken. Subjects filled Questionnaire, and modified star excursion tests for dynamic balance and core strengthening program were done, data was collected and analysed & treated. Total 4 weeks 5 times in week of exercise protocol given. Modified star excursion scale used for dynamic

balance pre and post of training period. Illinois t-test test used for assess the agility pre and post of training period.

Result and Conclusion:

This review also analyzed published literature from India to understand the role & effectiveness of static & dynamic stretching exercise programs in improving balance & flexibility in female athlete players. This exercise shows positive effects. The purpose of this study was that have been effective in lowering the injury incidence. Expanding the availability and scope of these programs is a pressing concern for social support networks as well as global health and fitness providers.

According to current evidence, exercises is a low-cost, non-invasive alternative treatment designed specifically to decrease risk of injuries with good balance and good flexibility with the help of dynamic static & dynamic balance exercises, increases core strength, increase agility, effect on good performance. . Engaging in regular physical activity is a secure and efficient way to lessen to decrease risk of injuries, increases core strength, increase agility, effect on good performance. Long- term positive benefits from consistent practice will also help to further reduce these symptoms and enhance the players general activities. The best training strategy for injury prevention seems to be physical activities, regular exercises. The fact that this exercise has no negative physiological consequences is also a crucial component.

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Refernces:

1. Opplert J and Babault N. Acute effects of dynamic stretching on muscle flexibility and performance: an analysis of the current literature. Sports Medicine 48, 2018 1-27.
2. Turki, Olfa; Chaouachi, Anis; Behm, David G; Chtara, Hichem; Chtara, Moktar; Bishop, David; Chamari, Karim; Amri, Mohamed.Effect of warm-ups incorporating different volumes of dynamic stretching on 10-m and 20-m sprint performance in highly trained male athletes.J Strength Cond Res. 2012 Jan.
3. George M Pamboris, Marika Noorkoiv, Vasilios Baltzopoulos Douglas W Powell Tom Howes, Amir A Mohagheghi Influence of dynamic stretching on ankle joint stiffness, vertical stiffness and running economy during treadmill running. 10.3389, 2022, 948442.
4. Anders Henricson, Annika Larsson, Ewa Olsson and Nils Westlin. The effect of stretching on the range of motion of the ankle joint in badminton players, Journal of Orthopaedic & Sports Physical Therapy, Published Online: 5 (2) , September 1, 1983,74-77

5. Zhenxiang Guo, Yan Huang , Zhihui Zhou and Bo Leng, The effect of 6-week combined balance and plyometric training on change of direction performance of elite badminton players, Front Psychol 10, 2021 Jan 12:684964.

6. Paulo H. Marchetti, Fernando H. D. and de Oliveira Silva, Upper limb static-stretching protocol decreases maximal concentric jump performance. J Sports Sci Med. 13(4): 2014 Dec 945–950.
7. Jibi Paul et al, Comparative effect of static and dynamic stretching exercise to improve flexibility of hamstring muscles among non-athletes, Journal of Physiotherapy. 1 (4), 2014,195-199.

8. Dimitris Chatzopoulos , Christos Galazoulas , Dimitrios Patikas , Christos Kotzamanidis Acute effects of static and dynamic stretching on balance, agility, reaction time and movement time. Journal of Sports Science and Medicine 13, 2014, 403-409.

9. U. Sekir, R. Arabaci, B. Akova, S. M. Kadagan Acute effects of static and dynamic stretching on leg flexor and extensor isokinetic strength in elite women athletes. Scandinavian Journal of Medicine & Science in Sports 20, 2010 268-281.

10. Kieran O'Sullivan, Elaine Murray, and David Sainsbury The effect of warm-up, static stretching and dynamic stretching on hamstring flexibility in previously injured subjects, BMC Musculoskeletal Disorders 2009, 10:37.

11. Opplert J and Babault N. Acute effects of dynamic stretching on muscle flexibility and performance: an analysis of the current literature. Sports Medicine 48, 2018 1-27.

12. .Chen C.H., Xin Y., Kuang Wu Lee, Ming Ju Lin, Jiu Jenq Lin, Acute effects of different dynamic exercises on hamstring strain risk factors. PLoS One 13,2018, e0191801. 30.4.

13. Herman SL and Smith DT. Four-week dynamic stretching warm-up intervention elicits longer-term performance benefits. J Strength Cond Res., 22 (4) 2008: 1286-1297

14. Phil Page, Current concepts in muscle stretching for exercise and rehabilitation International Journal of Sports Physical Therapy.; 7(1) 2012 Feb, 109–119.

15. Rajiv Sighamoney, Raika Kad and Ujwal L Yeole. Effect of core strengthening on dynamic balance and agility in badminton players, International Journal of Physical Education, Sports and Health; 5(1) 2018: 86-88