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REGIONAL DISTRIBUTION OF DANCE SPORTS INJURIES IN LATIN DANCERS

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SUMMARY

The aim of this study is to assess the location, type and occurrence periods of dance injuries in latin dancers. A total of 40 latin dancers (20 from each gender) who were aged 24.5 ± 6.2 yrs (13 to 39) took part in the study. Some of the questionnaires were delivered during a national competition, and some via e-mail. It was observed that 65% of dancers have had an injury; 55% being affected in their lower extremities, 27.5% in the trunk and spine area, 20% in their upper extremities, and 5% in the head region. A detailed classification of the injuries will be given and discussed. Lower extremity injuries occur more frequently in Latin dancers from each gender.

Key words: Latin dancers, dancing injuries, injury location, periodicity of injury, physical fitness

ÖZET

LATİN DANSÇILARDA DANS-SPORU YARALANMALARININ BÖLGESEL DAĞILIMI

Bu çalışmanın amacı latin dansçılarda dans yaralanmalarının bölgesi, çeşidi ve gerçekleşme zamanlarını değerlendirmektir. Ortalama 24.5 ± 6.2 yaşında (13-39 yaş aralığında) 40 dançı (20 kadın, 20 erkek) çalışmada yer aldı. Bir yarışma sırasında veya e-posta yolu ile kendilerine yaralanmaları ile ilgili anket uygulandı. Dansçıların %65'inin yaralanma geçirdiği, bu yaralanmaların %55'inin alt ekstremitede, %27.5'inin gövde ve omurga bölgelerinde, %20'sinin üst ekstremitede ve %5'inin ise baş bölgesinde gerçekleştiği gözlendi. Yaralanmaların detay dökümü verilip tartışılmaktadır. Sonuç olarak seçilen popülasyondaki latin dansçılarda alt ekstremite yaralanmalarının daha yaygın olduğu saptandı.

Anahtar sözcükler: *Latin dansçılar, dans yaralanmaları, yaralanma zamanı, yaralanma bölgesi, fiziksel uygunluk*

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INTRODUCTION

Latin dancing (LD) can be practiced for its social aspects, to have fun and to be fit, as well as for competitive reasons. Like most dancing activities, LD requires many years of practice to reach artistic awareness, strength of expression, feeling of musicality, correct technique and body position, in perfect harmony with the movements of the partner. While dancers create different lines and figures with intense expression, they sometimes exceed their physical and psychological capacity limits. In performing both basic skills and creative movements, and while exploring their movement potentials, they may suffer injuries.

Dancing, like numerous natural, complex sensorimotor activities, requires the integration of spatial pattern, rhythm, synchronization to external stimuli, and whole-body coordination (3). LD are Samba, Cha-cha-cha, Rumba, Paso Doble and Jive. Dancing competition, athletes produce multiple performances of 90 to 120 seconds, as they progress from one round to another. Years of training are required to perform the most challenging steps, and figures appear effortless in time. Physical conditioning, hard work, stern discipline, mental training, as well as imagination are prerequisites for athletes to achieve excellence in dancing as a sport (11,23).

The intensity of training is a key factor in suffering injuries. The musculoskeletal system responds well to gradual increases in challenges, but poorly to acute ones (8). Incorrect technique can cause biomechanically unsafe and unsound movements, which place unnecessary stresses on muscles, bones, and joints (4). Regardless of the sport or skill, it is essential to have correct biomechanical positioning, or postural control, in order to maximize energy transfer. Correct postural control requires a strong, stable core. Many injuries that are not caused by direct contact are due to body mechanics, and they typically can be linked to a lack of core stability. Being able to maintain a stable core allows for instantaneous adaptations to postural changes that occur with movement (15).

Commonly reported dance-related injuries are fractures, structural deformities (hallux abducto valgus, hallux limitus, hallux rigidus and contracted digital deformities, impingement syndromes of ankle, chondral injuries), overuse injuries including tendon and fascial injuries (plantar fasciitis, achilles tendinitis and enthesopathy, tenosynovitis of the flexors and/or extensors, shin splints), sprains and strains of the ankle, subtalar, midtarsal, tarsometatarsal and metatarsophalangeal joints (22).

There are numerous causes of injury in dancing, and many investigators have documented risk factors such as past medical history, anatomical characteristics, menstrual history, dance experience, length of dance training, fatigue and stress, risk factors related to body characteristics and nutrient intake, levels of conditioning or physical fitness parameters (20). The aim of this study is to assess the location, type and periods of dance injuries faced by latin dancers.

MATERIAL and METHODS

A total of 40 latin dancers (20 of each gender) who were 24.5 ± 6.2 years old (range 13-39 years) took part in the study. The mean body weight of the dancers was 58.3 ± 9.6 kg, and their mean height was 1.70 ± 0.07 m. They were given a structured questionnaire, and asked about the type of injury, injury period and location. Some of the questionnaires were delivered during a national level competition, and some via e-mail. The evaluation was done by calculating rates of data in question.

RESULTS

Descriptive statistics for female and male dancers are given in Table 1, and the location of the injuries in each gender in Table 2.

Table 1. Descriptive statistics for latin dancers as means ± SD (min-max)

Parameters	Females		Males	
Age (yr)	24.9 ± 5.8	(13-26)	24.0 ± 6.6	(15-39)
Height (m)	1.65 ± 0.04	(1.58-1.72)	1.75 ± 0.07	(1.60-1.85)
Body weight (kg)	51.5 ± 5.1	(42-63)	65.2 ± 8.1	(50-79)
BMI (kg/m^2)	18.8 ± 1.4	(16.0-21.3)	21.2 ± 1.7	(17.6-24.5)
Dance experience (yr)	5.4 ± 4.0	(0.5-13.0)	5.3 ± 4.6	(0.5-20.0)
Weekly training (h)	12.4 ± 5.2	(1.0-24.0)	13.0 ± 6.7	(2.0-30.0)
Daily training (h)	2.95 ± 0.76	(1.5-4.0)	3.15 ± 0.81	(2.0-5.0)

The main types of the injury in all dancers could be classified as strains (17.5%), sprains (15%) and overuse injuries (15%). Injury location distribution in all dancers was as follows: lower extremities (57.5%), trunk and spine (27.5%), upper extremities (20%), and head (5%). Lower extremity injuries comprised the knee (32.5%), the ankle (25%), the feet or toes (22.5%), the Achilles tendon or the heel (5%), the thigh (5%), and the hip (2.5%). Trunk and spine injuries were located in the lower trunk (15%), the neck (10%), and the upper trunk (10%). Upper extremity injuries were observed in the shoulders (15%), the wrists (12.5%), the fingers (5%), and the elbows (2.5%).

Table 2. Frequencies of injuries in the female and male dancers

Location	Female dancers	Male dancers
Head	5	5
Face	5	-
Teeth	-	5
Trunk and spine	40	15
Cervical spine	20	-
Upper trunk	15	5
Lower trunk	20	10
Ribs	15	-
Upper extremity	25	15
Shoulders	20	10
Arms	-	5
Elbows	-	5
Wrists	15	10
Fingers	5	5
Lower extremity	55	60
Hip joints	5	-
Thighs	-	10
Calves	15	10
Knees	35	30
Ankle joints	25	25
Feet	30	15
Achiles tendon/heels	-	10

With respect to the periodicity of the injuries; 27.5% occurred following the reduced training periods, 22.5% happened during training, 12.5% during competition, 5.0% during the preparation period for the competition, and 2.5% within the menstruation period.

DISCUSSION

Dancers often have unusual difficulties related to the dynamic biomechanical forces required by their individual dance form (22). LD, together with slow efficient movements, involves a wide variety of fast and dynamic movements that include sudden accelerations, stops and turns. Dancers must also be fully aware of the rhythm of the dance, and the perfect harmony of the basic fundamentals with the music and partner.

In LD, partners display their movements as a couple. But scientific studies have demonstrated that physical and physiological differences

are important according to gender (17). At some dancing levels, these structural gender differences may impose some difficulties and lead to injuries. Therefore, learning and adaptation processes take substantially more time and repetitions for partners.

Most common types of injury in nearly all sports include sprains, strains and overuse injuries. Overuse injuries occur secondary to practice demands, multiple repetitions of single elements, and intense training. Since the athlete trains at or near the physiological threshold, significant changes lead to body breakdown and overuse injuries at the most critical times. Early injuries are related to poor baseline conditioning level. Pre-competition or pre-event injuries occur because of a significant change or increase in training demands just prior to competition (8).

The overall incidence of dance injuries across the spectrum of dance styles varies widely (22). There is evidence that musculoskeletal injury is an important health concern for dancers at all skill levels. There is high prevalence and incidence of lower extremity and back injuries, with predominance of soft tissue and overuse injuries (7). According to their statements, about two thirds of the dancers in the present study have had an injury, with 57.5% being affected in their lower extremities, and the types of injury mainly reported were strains, sprains and overuse injuries, in accordance with referred literature.

The spine is the second most injured area of the body in dancers. This often leads to hyperlordosis, spondylolysis, spondylolisthesis, lumbar facet sprain, discogenic back pain, muscle spasm and piriformis syndrome (6). The present study, even if based on personal statements, supports these findings. About 27.5% of all injuries occurred in fact in the trunk and spine. Correct posture and dance technique support injury prevention, and correct postural control requires a strong, stable core (4,15).

The ankle is an important joint to be considered in the context of dancing, as it is the connection between the leg and the foot that establishes lower extremity stability. Its function coordinates with the leg and foot, thus it is crucial in view of the dancer's ability to perform (19). In the present study; the knee, ankle, foot and toes were the most common sites of injury in the lower extremity (32.5%, 25% and 22.5%, respectively). Ankle inversion injuries are the most common traumatic injuries in dancers. The ability of the dynamic and static stabilizers of the ankle joint to maintain their structural integrity is a major component of the normal gait cycle (18,22). It was shown that female dancers exhibit longer time to stability after landing from a vertical jump, compared with their male counterparts. These balance differences may be a factor related to the higher rate of ankle sprains among female dancers (16).

In LD, the woman performs most of the spins and pivots, although there are a range of moves that require the man to spin also. So, the lady is most often at risk from sustaining an ankle or knee injury. The male partner can reduce her risk of injury by ensuring that the moves chosen to lead give the lady adequate rest and body movement variation. Coordination of position and movement between dance partners requires not only expertise, but also trusting each other's skill and control (4).

Foot and ankle injury can be caused by uneven ground surfaces; such as hard, restrictive, sloping, and slippery ones. They can cause the dancer to tighten up his/her foot muscles, and add resistance to the movement (4). Biomechanically evaluating the function is critical to develop a differential diagnosis and identifying the cause for any type of dancer. Shoes that are required for each type of dance must also be evaluated (22). Appropriately selected dance shoes can be valuable in distributing load, absorbing impact and supporting the feet. Warming up the ankles and the feet is rather important, because they are constantly functional during dancing, and they are shock absorbers for the body (4).

Like LD, female ballroom dancers seem to have higher incidence of forefoot complaints compared with other types of dancers. This incidence is attributable to the types of shoes that are typically high heeled with very thin soles and extremely tight fit, as well as to certain turns and steps that require persistent weight on the forefoot Further disabling forefoot complaints of concern are ingrown toenails with or without infection, subungual bleeding, cracking or breaking of nails, and fungal infections of the skin or nails. Skin injuries are irritating should the dancer develop blisters or corns on the dorsal aspect of proximal interphalangeal joints, and painful irritations include viral infections causing verruca (22).

Movement transitions and its control between couples are achieved in upper extremities. Some positions may predispose to injury during speed development, movement balancing or stopping, quick direction/ plane changing, and following spinning/pivoting. In the present study, upper extremity injuries occurred mostly in the shoulders and the wrists.

Dancers and gymnasts display greater range of movement in their hips, shoulders, ankles and lumbar spines than their age-matched counterparts (5). They frequently sustain hip injuries, including labral tears, coxasaltans, stress fractures, tendinoses, and joint diseases. High velocity kicks (grand-battement) with extreme abduction and external rotation may stress the hip, sacroiliac joint, and the surrounding soft tissue (2). In addition, the feet should be at a comfortable degree of turn out and should not cause pain in the hip, knees, ankles or feet. Proper feet and ankle alignment reduces the risk of ankle collapsing or weakening (4).

While many factors contribute to sporting success, absolute body size is in many cases a critical one (1). Dancers have low body weights and body fat ratios (21). Inadequate energy intake reduces the ability of the athlete to sustain training at high intensities or to exercise for extended periods, and has the potential to increase his or her risk of injury (14). Poor eating behaviors are also associated with deficits in micronutrients. Dehydrated athletes are prone not only to energy deficits, but also to overuse injuries (8). Warming up is important, but cooling down is just as important, which will support the muscles and tendons, and prepare the body for resting following exercise. Also rest is just as important as technique, reducing the risk of overload (4). Wrong working volume, intensity and recovery pause management may lead to injuries.

When attempting to create an injury prevention program, one must first identify and document the problem, clarify the population at risk, and consider any associated factors. Injury risks and patterns vary by gender, and the specific demands are unique to the particular sport (8). The domains of prevention, clinical evaluation and diagnosis, treatment, and rehabilitation and reconditioning are focused on within the context of dance medicine (12). Proprioceptive/neuromuscular training plays a crucial part in the prevention of injuries (8,9,13). Recent data on dancers revealed that supplementary exercise training can lead to improvement of fitness parameters, and reduce the incidence of dance injuries (10).

In conclusion, the findings of the present study reveal that lower extremities are the most frequently injured parts of the body in latin dancers. In the prevention of these injuries, regular and comprehensive evaluation and medical examination of the dancers is essential.

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