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Prevalence of Injuries and Risk Factors in Dancers

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Abstract: ***Background: Dance is a form that places stress on the musculoskeletal system because the individual adopts anti-anatomic positions while performing a particular technique. The implication of repetitive movements which require adequate flexibility, endurance, and strength makes their bodies susceptible to overuse injuries. As each dance style is different with distinct characteristics, there is a possibility of having different types of injuries which are specific to each dance modality. Hence, there is a necessity to recognize the casual factors of dance injuries associated with a set of specific techniques and their certain elements used in daily practice. Method: This was a cross-sectional survey that included 50 samples both male and female who were practicing dance regularly. Components of the questionnaire to be filled by each subject named modified Oslo Sports Trauma Research Centre Questionnaire on Health Problems were explained which consisted of Individual Dance Injury Report Form and Dance-Specific Questionnaire on Health Problem. Results and Conclusion: Lack of seeking medical attention post-injury resulting in insufficient recovery from the initial injury was found to be a considerable risk factor in dancers. This concluded that the severity of injuries along with risk factors impacted the participation of a dancer as a performer.***

Keywords: Dance, Injuries, Risk Factors, Injury Prevention, and Awareness.

1. Introduction

Dance is an art that comprises of the fundamental element known as movement, the body is the raw material, which requires discipline, purity of alignment, possible expressions that are developed and enhanced to reach the magnificence of the worked techniques [2]. In the duration of participation in competitions and shows, dancers are put forward to the heavy workload of rehearsals and practice, which makes them commonly prone to injuries [6]. The probability of musculoskeletal injuries increases when participants are more involved in different dancing activities [11]. Moreover, each dance style hasa set of injuries, namely acute injuries and chronic injuries [8]. Acute injuries usually occur due to incorrect dance movements along with secondary factors like muscle fatigue, tiredness, and loss of balance [9, 11]. Chronic injuries can hamper the abilities of a dancer to dance for the rest of their lives [10].

The anatomic alignment of dancers might be a determining factor for adding limitations to movement, and when such boundaries are tried to prevail, it might make the dancer more liable to injury [11]. There can be repetitive microtrauma to bone or other soft tissue structures which might give rise to overuse injuries [11]. In such cases, the structure and function may be rendered inadequately as the offending factors fail to get eliminated and the cycle of injury will persist [11]. Physiological aspects such as age also influence injuries, for example, younger dancers are more prone to back and hip injuries while older dancers have a greater tendency to injure their leg, ankle, and foot [11]. The use of inappropriate dance techniques or lack of information and knowledge of the correct approach along with poor application has been put forward to be a risk factor for injury [11]. Hence, it is important to know the causes of injuries that occur in dancers, as it would help to understand how such injuries occur and the requirement to adopt preventive measures so that it would help in maintaining the health of the dancers [7].

There are certain demands and needs placed on the dancer`s body in regards to the strength of muscle, aerobic capacity and endurance, general flexibility, joint stability, somatosensory integration, and neuromuscular system coordination envisaging them as an athlete just as an artist [11]. Thus, the main objective of the study is to determine and find out the characteristics of different injuries that occur among dancers in relation to anatomic segment and mechanism involved, and investigate practice time, age, and common characteristics of different modalities as risk factors for sports injuries in dance and their profession and to find out about the possible risks involved and the measures to prevent them [6].

2. Literature Survey

SARAH J. KENNY et al [2018], underwent a study "**The Influence of Injury Definition on Injury Burden in Preprofessional Ballet and Contemporary Dancers**" with a sample size of 145 participants using an online questionnaire (modified Oslo Sports Trauma Research Centre questionnaire on health problems) using 3 injury definitions: (1) time loss (2) medical attention, and (3) any complaint. According to which Injury prevalence (seasonal proportion of dancers injured), incidence rates (count of new injuries per 1000 dance-exposure hours), and severity (total days lost) were examined across each definition, registration method, and dance style. The result of the study depending on definition, registration, and dance style, injury prevalence ranged between 9.4% (95% confidence interval [CI]: 4.1%, 17.7%; time loss) and 82.4% (95% CI: 72.5%, 89.8%; any complaint), incidence rates between 0.1 (95% CI: 0.03, 0.2; time loss) and 4.9 (95% CI: 4.1, 5.8; any complaint) injuries per 1000 dance-hours, and days lost between 111 and 588 days. And hence they concluded time-loss and medical-

attention injury definitions underestimate the injury burden in preprofessional dancers. Accordingly, injury surveillance methodologies should consider more inclusive injury definitions [14].

3. Methods / Approach

3.1 Methodology

Study Design-Cross-sectional survey. Study Method-Convenient. Sample Subjects-Dancers. Sampling Method-Random Sampling. Sample Size-50. Study Setup-Dancers in and around Pune.

3.2 Materials Required

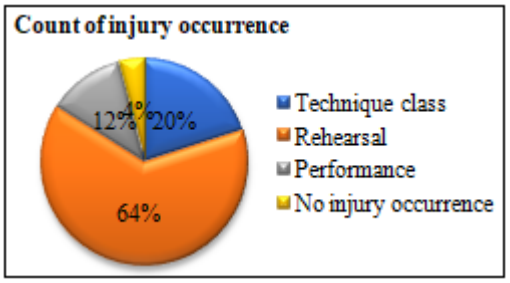
Demographic Data Sheet, Modified Oslo Sports Trauma Research Centre Questionnaire on Health Problems, Paper, and Pen.

3.3 Approach

The study was approved by the institutional ethical committee of Tilak Maharashtra Vidyapeeth, Department of Physiotherapy. Permission was taken from the institutional ethical committee of Tilak Maharashtra Vidyapeeth. Different Dance coaching classes in and around Pune were approached and permission was obtained before the study. Dancers between age group 18-35 years both male and female, practicing dance on regular basis, with practice experience between 0 to 20+ years were elected for the study. Individuals with any comorbidity who underwent any recent surgery and had a history of any cardiovascular diseases were excluded from the study. The aims and objectives of the study were explained to the dancers. The consent form was filled out by those subjects and components of the questionnaire were explained.

4. Results and Discussion

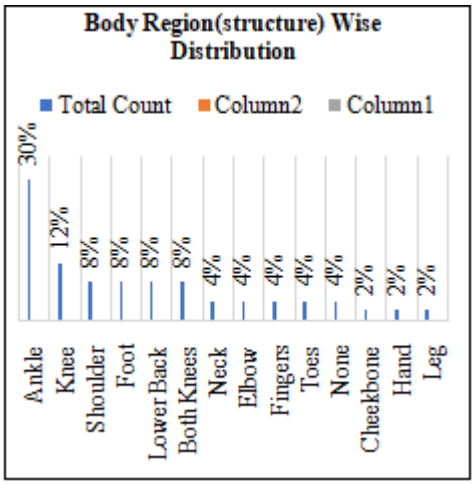
4.1Count of Injury Occurrence



Graph 1

INTERPRETATION: Graph 1 shows that out of 50 subjects 64% of dancers suffered maximum injuries during Rehearsals, 20% injuries occurred during Technique class, 12% injuries occurred during Performance, only 4% of dancers showed No injury occurrence.

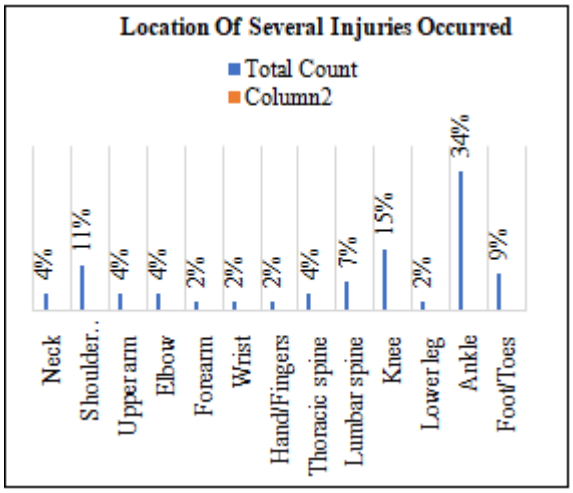
4.2 Body Region (Structure) Wise Distribution



Graph 2

Interpretation: Graph 2 shows that out of 50 subjects, the maximum number of dancers with a count of 30% had an Ankle injury, 12% had an injury on either one side of the Knee, Shoulder, Foot, Lower back, and both Knees as injury sites were seen in 8% of dancers.4% had injuries in Neck, Elbow, Fingers, and Toes, while 4% had no injuries at all. The remaining 2% of subjects had injuries in Cheekbone, Hand, and Leg.

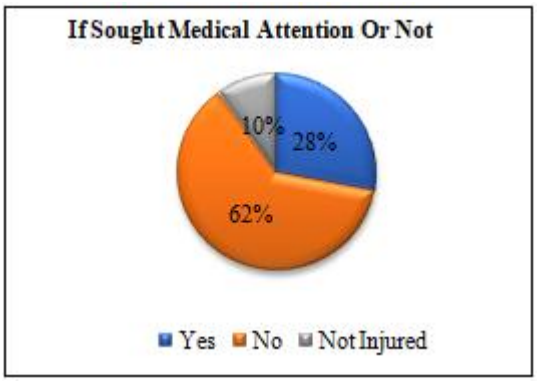
4.3 Location of Several Injuries Occurred.



Graph 3

INTERPRETATION: Graph 3 shows that out of 50 subjects 4% of dancers had injuries in the Neck region, 11% had injuries in the Shoulder (including Clavicle) region, 4% of dancers had several injuries in the Upper arm, Elbow, and Thoracic spine region. Injuries of Forearm, Wrist, Hand/Fingers, and Lower leg were involved in 2% of dancers.7% of dancers had injuries of the lumbar spine, 15% dancers had Knee injuries and 9% dancers had Foot/Toes injuries. While a maximum number of injuries occurred in the Ankle with a count of 34%.

4.4 If Sought Medical Attention or Not.



Graph 4

Interpretation: Graph 4 shows that out of 50 subjects 62% of dancers did not seek medical attention for the injuries they faced, while only 28% of dancers did seek medical attention for their injuries and the remaining 10% of dancers faced no injury.

4.5 Discussion

Dance is now known as a well-known art that requires proper schooling in a systematic schedule [1]. Dancers are considered as much athletes as artists, as to fulfill all the athletic demands that require dancing at a professional level, dancers are put forward through stressful events to attain an excellent physical aptitude [2, 5]. Since the individual adopts anti-anatomic positions while performing a particular technique, performing such techniques might require adopting certain postures which in turn may lead to the risk of placing stress on the musculoskeletal system [3, 4]. Constant repetition of positions and different choreographic postures requires a lot of physical training that sometimes exceeds the dancer's physical capabilities, along with the absence of sufficient breaks while training, which has been found to support the fact that leads to the occurrence of lesions [3]. Studies done have shown that performing aerial movements like jumps, their forms, and landing time has been contributory risk factors for the development of injuries in dancers [3]. This can hamper their participation as elite dance performers. Therefore, a study for determining and exploring various musculoskeletal (dance-related) injuries and analyzing possible risk factors must be carried out.

Two parts of the modified Oslo Sports Trauma Research Centre Questionnaire on Health Problems were filled by each participant: Individual Dance Injury Report Form and Dance-Specific Questionnaire on Health Problem. The main content of the questionnaire was to determineanticipated consequences of reported health problems (injury, illness, and other problems) for dance participation, dance performance, training volume, and symptoms/complaints experienced during the previous week [14]. If participants reported full participation without problems, no reduction to the amount of dancing, no impact on dancing, and experienced no symptoms, then the questionnaire was finished [14]. If participants reported a health problem, they were prompted to define it as an injury or illness and answer further questions about each [14].

From the total of 50 participants, 52.0% participants belonged to the age group of 21-25 years, 20% belonged to the age group of 18-20 years while the remaining 14.0% belonged to the age group of 26-30 years and 31-35 years, out of which 60% were females and 40% were males [15]. The maximum number of dancers practiced Hip-Hop style with the count of 20%, followed by 16% subjects practicing Contemporary, 12% practicing Bharatanatyam. Salsa and Latin dance styles were practiced by 10% of subjects and Ballet by 8% of dance subjects.6% of subjects each practicing Bollywood, Salsa, and Belly dance style, Garba+ Bollywood along with B-Boying practiced by 4% each and remaining 2% dancers practicing dance styles such as Krumping, Freestyle, Waacking and Mambo [15]. Out of 50 subjects, 32% of participants had dance experience of 16-20 years, 28% had an experience of 6-10 years and 18% of subjects had 0-5 years of dance experience.12% of subjects had 11-15 years of experience in dance practice while the remaining 10% of subjects had more than 20 years of experience in dance practice.

A maximum number of dancers had new injuries with a count of 64%, Reinjury occurred in 34% of dancers who were previously healed and 4% of dancers had no Injury at all. Graph no.1 shows that 64% of dancers suffered maximum injuries during Rehearsals, 20% injuries occurred during Technique class, and 12% during Performance, only 4% of dancers showed No injury occurrence. The injuries that occurred during technique class involved styles such as Bharatanatyam, Contemporary, Salsa, Ballet, and Latin. Thus, it was observed that maximum dancers sustained new injuries and reinjuries during rehearsals. It was reported that most of the injuries involved sudden onset and NO contact with any dancer or props whereas the least number of injuries were sustained when groups had sudden onset and contact with another dancer or props [14]. Several reports supporting the subjective causes of injury were noted, which include-bad flooring and improper training, overtraining/ overexertion, and overpressure, skipping a warm-up before rehearsals, repetitive movements and loss of balance, inappropriate landing and jumping techniques, muscle fatigue, and incorrect technique and improper handling of props [16, 17, 18].

Graph no.2 shows that out of 50 subjects, 30% of dancers had the highest number of injuries in Ankle, 12% had injuries on either one side of the Knee, Shoulder, Foot, Lower back, and both Knees as injury sites were seen in 8% of dancers.4% had injuries in Neck, Elbow, Fingers, and Toes, while 4% had no injuries at all. The remaining 2% of subjects had injuries in Cheekbone, Hand, and Legs [14]. As a result of this, some dancers were unable to fully participate in any dance or daily activities for 1 day beyond the day of onset of injury while some were unable to fully participate in any dance or daily activities for more than 1 day beyond the day of onset of injury (Full Time Loss Injury) [14].

Questions related to health problems were asked to evaluate how it influences dancer participation, according to which it shows that out of 50 subjects, 40% of dancers were able to fully participate in dance activities without any health problems, and 38% were able to fully participate but with injury/illness, around 16% of subjects exhibited reduced

participation due to injury /illness while 6% could not participate due to injury/illness [14]. It was seen that 50% of dancers had problems in participation to a minor extent, 8% to a moderate extent while 6% of dancers' participation was affected majorly.34% of subjects had no issues in participating while 2% were unable to participate at all.

Among all 50 subjects, 60% of dancers had a history of Injury while 20% of dancers had a history of Illness, and the remaining 20% of dancers had no history of Injury/Illness. Out of which 4% dancers had injuries in the Neck region, 11% had injuries in the Shoulder (including Clavicle) region, 4% of dancers had several injuries in the Upper arm, Elbow, and Thoracic spine region. Injuries of Forearm, Wrist, Hand/Fingers, and Lower leg were involved in 2% of dancers.7% of dancers had injuries of the lumbar spine, 15% dancers had Knee injuries and 9% of dancers had Foot/Toes injuries, while a maximum number of injuries occurred in the Ankle with a count of 34% as per result of Graph no.3 [14]. Major symptoms that were experienced by the subjects due to illness included-Fever, Sore throat, Swollen glands, Blocked/runny nose, and Cough. Many subjects encountered anxiety and depression that makes us understand how dance training and the impact of an injury can transcend a dancer's financial, mental, social, and emotional well-being. Some subjects also mentioned Fatigue and exhaustion which significantly impacted their participation in dance rehearsals and performances [14].

Graph no.4 shows that out of 50 subjects, 62% of dancers did not seek medical attention for the injuries they faced, while only 28% of dancers did seek medical attention for their injuries and the remaining 10% of dancers faced no injuries [14]. Therefore, it is evident that the very least number of dancers seek medical assistance in case of injury due to fear of interruption in their dance training [12]. Insufficient recovery, inadequate treatment, and early return to dance from initial injury are considered potential risk factors. Hence, the embodiment of education and injury prevention strategies is essential in dancers at an early stage.

At the initial level, technical mistakes are primarily the main root cause of pain, and correction of these mistakes may be all that is required. A recommendation from this study is that a proper warm-up and cools down session along with proper stretching is advisable for the dancers, as the performance of warm-up exercises increases core body temperature, which prepares the muscles and joints for the demands placed by the dance. Accordingly, an activity plan should be implemented, from swimming or cycling to decrease WB stresses or some other such contingency plan so that the dancer can remain active as he or she recovers [13]. All these can help prevent injuries and improve the dancer's overall performance.

5. Conclusion

In this study, we concluded that the prevalence and severity of injuries along with risk factors were noticed to impact the participation and performance of dancers.

6. Limitations and Future Scope of Study

6.1 Limitations

1) Sample size was less.
2) No particular geographic area was taken into consideration.
3) Different age groups were not considered.

6.2 Future Scope of Study

1) A similar study can be done on both genders separately.
2) No particular dance style was taken into consideration.
3) Basic physiological assessment of strength, flexibility, posture, muscle endurance, stamina, and cardiorespiratory capacity of the dancers which can have an impact on injury risk and health of a dancer can be taken into consideration.

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