

Risk Factors for Lower Extremity Injuries in Hip-Hop Dancers

Maria Jacintha Stella¹, Ni Luh Nopi Andayani², I Wayan Sugiritama³

¹Physiotherapy Undergraduate and Physiotherapy Profession, Faculty of Medicine, Udayana University, Denpasar, Bali, Indonesia.

²Department of Physiotherapy, Faculty of Medicine, Udayana University, Denpasar, Bali, Indonesia.

³Department of Histology, Faculty of Medicine, Udayana University, Denpasar, Bali, Indonesia.

Corresponding Author: Maria Jacintha Stella

DOI: <https://doi.org/10.52403/ijrr.20240440>

ABSTRACT

Background: Hip-hop dance is one of many types of dances that is very popular in the international community. Dance is a profession that combines art with sports so it is very vulnerable to injury. Lower extremity injuries in dancers can occur due to muscle weakness, extreme movements, or overuse.

Objective: To determine the risk factors that can cause lower extremity injuries in hip-hop dancers.

Method: The method used is a literature review with a compilation of journals related to risk factors of lower extremity injuries in hip-hop dancers taken in the form of PubMed page.

Results: It's really common for dancers who report injuries to lose time for work because of the physical limitation due to the injury. Based on the journals reviewed, factors that often caused dancers to suffer injuries include overuse (35.2%), lack of or not warming up before dancing (37%) fatigue and muscle stiffness in the lower extremity (51.6%), joint hypermobility (43 %), and using incorrect dancing techniques (49.1%).

Conclusion: Based on literature reviews and the discussion in the journals discussed, the results show that fatigue and muscle stiffness were the common factors that caused lower extremity injuries in hip-hop dancers.

Keywords: Risk Factors, Lower Extremity Injury, Hip-Hop Dancer

INTRODUCTION

Dance is a profession that has a mix of artists and athletes, so this profession is very vulnerable to musculoskeletal injuries and other illnesses. This health problem is an important factor for dancers for several reasons, such as most dancers have started their careers at a young age, the demands for physical and aesthetic interactions that dancers will provide to audiences, and the possibility that dancers have little education regarding bone health literature and joints^[3]. The main physical demands for a dancer are endurance, aerobic capacity, and muscle strength. Overall, dancers are required to have muscle flexibility, joint stability, somatosensory integration, and neuromuscular coordination. Dances have several techniques, such as styles hip-hop, modern, tap, musical theatre, jazz, folk, ethnic (traditional), and classical ballet^[4]. Dance hip-hop developed along with cultural developments in hip-hop, including rap music, graphic arts, and fashion mostly African-American and Puerto Rican youth, Bronx, New York in the late 1960s to early 1970s ^[10]. Hip-hop dance is also known as street dance or street dancing because teenagers at that time danced hip-hop on the street. This dance spread rapidly in 1980 because many audiences began to see the

dance hip-hop on MTV which is an American cable channel based in New York11. Characteristics of hip-hop movements are characterized by the presence of bouncing movements or bouncing, bending the knee, jumping, turning, isolated movement and various extreme movements of the body. These movements can potentially result in injury if the dancer uses the wrong technique when performing the movement, makes sudden jerking movements, makes an unbalanced landing, or is in the wrong position after jumping^[9].

Injuries in hip-hop dancers can cause a decrease in performance and job opportunities, retirement too early, and increase the risk of complications in the future such as osteoarthritis or other degenerative conditions^[8]. Injuries can be a cause for concern because of the risk of long-term pain, and physical limitations, so they can reduce body function in physical

activity in the future^[1]. The majority of injuries to hip-hop dancers occur in the lower extremities with a percentage of 82.6%, starting with the knees at 52%, then the groin and trunk at 13%, ankles and thighs at 9%, then the remaining 4.3% were injuries to the upper extremities^[6].

Among the many dance styles, most resulting injuries occur during training or dance battles. The most common time for injury to occur is mid-dance. 84.5% of injury cases were acute injury cases. The possibility of acute injuries reported by dancers could occur due to overuse or excessive use and incorrect movements^[6].

METHODS

The method used is a literature review prepared using research journals relating to risk factors for lower extremity injuries in hip-hop dancers taken from the page PubMed which was published in 2012-2020.

RESULT

Writer	Title	Method	Results
Ojofeitimi S, Bronner S, Woo H (2012)	Injury Incident in Hip Hop Dance	Research in this journal uses methods web-based or internet surveys which is a method collecting data through surveys or filling out questionnaires that are sent via the internet to samples (respondents) and can be responded to by everyone. The data in this research was carried out for five months via the website Survey Monkey with 45 multiple-choice and open questions. The questions asked were questions approved by an internal review board (an official group established to review and monitor biomedical research involving humans) and then the survey was piloted and modified according to hip-hop professional dancers	Differences in dance styles are one of the factors causing injuries to dancers. Dancer breakers have a higher injury rate compared to poppers/lockers. Lower extremity injuries experienced by breakers reached 49%. Meanwhile, incidents of lower extremity injuries that occurred in poppers/lockers reached 62%. In the lower extremities, the most common physical complaints occur in the feet and ankles. Fifty percent of the dancers indicated that overuse is the most common cause of injury. Followed by wrong landing after jumping (42%), twisting movement (36%), and slipping during movement (31%). The second common cause is injury resulting from lack of warm-up (62%) and muscle fatigue (57%).
Olga Tjukov, MA, Tobias Engeroff, PhD, Lutz Vogt, PhD, Winfried Banzer, PhD, MD, and Daniel Niederer, Ph.D (2020)	Injury Profile of Hip-Hop Dancers	This study used the method of cohort retrospectives. Researchers provide a questionnaire that will be used to conduct a survey of hip-hop dancers with five styles different. The sample used German residents with 67 female dancers and 79 male	Most injuries result in hip-hop dance style in the lower extremities with a percentage of 82.6%. The injury started in the knee by 52%, Groin or crotch by 13%, ankles by 9%, and thighs by 9%. The most common time for injuries to dancers is in the

		<p>dancers who danced at least one dance style for one year and one and a half hours of practice time during the week.</p> <p>The injuries studied were injuries that caused loss of work time that limited the dancer for at least 24 hours outside of the injury report.</p>	<p>middle of the dance (59.3%) then at the end of the dance (25.9%) and the least common is at the start of the dance (14.8%). Injuries resulting from dancing in a way general is traumatic injury or acute injury.</p> <p>Most injuries reported by the dancer are injuries due to the use of body parts (34%), the wrong use of dance techniques wrong (28%), no warm-up before dancing (12%), poor heating before dancing (9%) and muscle fatigue (9%).</p>
Shaw Bronner, Naomi G. Bauer (2018)	Risk Factors For Musculoskeletal Injury in Elite Pre-Professional Modern Dancers: A Perspective Cohorts Prognostic Study	<p>The research design in this journal uses reviews of retrospectively designed prospective cohort studies.</p> <p>This research consists of two parts of data collection, namely pre-season screening data and four years of data collection injury clinic (IC) using the form. Both tests are performed by a physical therapist (physical therapist) who has abilities in the field of dance medicine.</p>	<p>The result of the Beighton score used by researchers in this study shows the average Beighton score showed a value of 3.59 to 2.08 with 77.6% of dancers having results Beighton score low (40.7%) and high yield (36.9%).</p> <p>Dancers with a score Beighton low (43%) will be more likely to avoid accidental injuries and joint hypermobility.</p>
		<p>Measurements were carried out using the Beighton score which focuses on four possible risk factors, namely hypermobility, dance technique, muscle flexibility, and old injuries.</p>	<p>Around 37% of dancers score in the dancing technique category showing the smallness less likely to avoid injury compared to dancers with the use of the correct technique.</p> <p>As many as 89% of dancers with conditions of two or more tense and unstable muscles show the possibility of great risk of getting injured due to the condition their muscle stiffness.</p> <p>As many as 38% of dancers had a history of injury before doing it This research shows that there is a possibility of getting more serious injuries compared to dancers who do not have a history of injury.</p>
Sarah DiPasquale PT, DPT Nicole Becker, Sarah Green, Kim Sauers, B.S (2015)	Self-Reported Injury and Management in a Liberal Arts College Dance Department	<p>This research uses a survey collection method via Survey Monkey web with a sample of dancers registered in Skidmore College by mastering at least one dance technique.</p> <p>Dancers are asked to complete a questionnaire following an injury during the fall 2014 semester. Forms are available as a hard copy. Data will be collected anonymously and web surveys will be collected without Enter the dancer's IP data.</p>	<p>As many as 63% of dancers who reported injuries did not show any recurrence of the old injuries suffered. Relapse may have occurred before or during the time of data collection.</p> <p>Of the total injuries reported, 56.5% were injuries occurred during engineering classes and 15.2% occurred during training.</p> <p>As many as 50% of dancers get an injury to your leg because you don't wear footwear when dance. Dancers too report an injury due to excessive use of a limb as much as 21.7%. Injury Others that occurred in dancers were caused by twisting and landing movements after jumping (6.5%) and combined injuries because dancers chose more than one option on the questionnaire (26.1%).</p>

DISCUSSION

In research conducted by Ojofeitimi S, et al

in 2012, was found that the factor that causes lower extremity injuries in dancers

is the dancers' mechanism of movements. The most common mechanism is excessive use of body parts (50%)^[5]. Excessive use or overuse is one of the factors causing injury because when a dancer uses his body continuously, the dancer's limbs are more likely to suffer injuries such as arthritis, cartilage injuries, tendonitis, and even inflammation^[12]. After excessive use, other common mechanisms, namely incorrect landing position after jumping (42%), twisting movements (36%), and slipping (31%) also cause injuries to the dancers. Apart from the mechanism by which dancers perform movements, the research stated that the main factors that cause dancers to get injured are the lack of warm-up before dancing (62%) and muscle fatigue (57%)^[5].

In research conducted by Olga Tjukov et al in 2020, it was found that the injuries suffered by dancers were obtained while the dancers were training. *dance battle*, and performances. When doing these activities, dancers generally get the injury in the middle of the dance (59.3%). From the training factor, *dance battle*, and the performance, dancers reported that the most injuries were caused by overuse (34%) followed by using the wrong technique when performing movements (28%), dancers not warming up before dancing (12%), warming up was done poorly or not enough (9%), and the occurrence of muscle fatigue (9%)^[7].

In research conducted by Shaw Bronner in 2018, researchers used the Beighton score to focus their research on joint hypermobility. This research also focused on muscle flexibility factors, old injuries experienced by dancers, and dance technique. From research using the Beighton score, it was found that 43% of dancers who had a low Beighton score or did not experience joint hypermobility would have a small chance of getting injured due to the dancer's ability to maintain balance. In research on dancing

techniques, researchers use bending the knees (*plie*), lifting the legs (*developpe*), and jumping movements which are carried out several times to evaluate so that the researchers get results for the dancing techniques used by the dancers. From this research, it was found that 37% of dancers who use the wrong technique have a high chance of getting injured. In muscle flexibility research, researchers focused the research on four lower extremity muscles, namely hamstrings, iliopsoas, rectus femoris, and iliotibial band. The researchers then tested these four muscles by asking the dancers to sleep on their backs, then the researchers measured muscle flexibility using a goniometer. From this study, researchers found that 89% of dancers with two or more stiff muscles had a high chance of getting injured. This muscle strength research focused on four lower extremity muscles, namely the hamstring, iliopsoas, rectus femoris and iliotibial band. These four muscles will later be measured using the SLR or straight leg raise method with the dancer sleeping on their back. The results of this test will show two results, namely stiff and not stiff. Meanwhile, the results of research on old injuries, as many as 38% of dancers who had injuries before the research was conducted, showed that there was a possibility of getting more serious injuries compared to dancers who did not have old injuries^[2].

Research conducted by Sarah DiPasquale et al in 2015 used the method web-based by distributing questionnaires from the page Survey Monkey. This research produced several factors that caused injuries to dancers at Skidmore College. The results of this research show that in general, 56.5% of injuries occurred to dancers during movements in technique class and 15.2% of injuries occurred while dancers were doing research. When the dancer carried out this activity, the dancer again reported the injury he had received. As many as 50% of dancers experience

injuries due to not wearing footwear when dancing, such as peeling or blistered skin. Dancers also reported excessive use of body parts due to these activities at 21.7%^[6].

CONCLUSION

Based on the literature review and discussions in the journals discussed, the results showed that fatigue and muscle stiffness were the main factors in the occurrence of injuries to the lower extremities in hip-hop dancers. Another risk factor that causes injuries to the lower extremities in hip-hop dancers is excessive use of body parts or overuse, lack of or no warm-up before dancing, lower extremity muscle fatigue and stiffness, joint hypermobility, and use of incorrect dance techniques.

Declaration by Authors

Ethical Approval: Not Applicable

Acknowledgment: None

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Beckenkamp, P. R., Lin, C.-W. C., Engelen, L., & Moseley, A. M. (2016). Reduced Physical Activity in People Following Ankle Fractures: A Longitudinal Study. *Journal of Orthopaedic & Sports Physical Therapy*, 46(4), 235–242. doi:10.2519/jospt.2016.6297
2. Bronner, S., & Bauer, N. G. (2018). Risk factors for musculoskeletal injury in elite preprofessional modern dancers: A prospective cohort prognostic study. *Physical Therapy in Sport*, 31, 42–51. https://doi.org/10.1016/j.ptsp.2018.01.008
3. Hincapié, C. A., Morton, E. J., & Cassidy, J. D. (2008). Musculoskeletal Injuries and Pain in Dancers: A Systematic Review. *Archives of Physical Medicine and Rehabilitation*, 89(9). https://doi.org/10.1016/j.apmr.2008.02.020
4. Motta-Valencia, K. (2006). Dance-Related Injury. *Physical Medicine and Rehabilitation Clinics of North America*, 17(3), 697–723. https://doi.org/10.1016/j.pmr.2006.06.001
5. Ojofeitimi, S., Bronner, S., & Woo, H. (2012). Injury incidence in hip hop dance. *Scandinavian Journal of Medicine and Science in Sports*, 22(3), 347–355. https://doi.org/10.1111/j.1600-0838.2010.01173.x
6. Pt, S. D., Becker, N., Green, S., & Sauers, K. (2015). Liberal Arts College Dance Department.
7. Tjukov, O., Engeroff, T., Vogt, L., Banzer, W., & Niederer, D. (2020). Injury Profile of Hip-Hop Dancers. *Journal of Dance Medicine & Science: Official Publication of the International Association for Dance Medicine & Science*, 24(2), 66–72. https://doi.org/10.12678/1089-313X.24.2.66
8. Zhang, W., McWilliams, D. F., Ingham, S. L., Doherty, S. A., Muthuri, S., Muir, K. R., & Doherty, M. (2011). Nottingham knee osteoarthritis risk prediction models. *Annals of the Rheumatic Diseases*, 70(9), 1599–1604. https://doi.org/10.1136/ard.2011.149807
9. Coban S. Knowledge: The Urban Skillz Dictionary. Hamburg: E-Book- Verlag Jungierek, 2013
10. Rajakumar M: Hip hop dance. Santa Barbara: E-Book- Greenwood. p.13, 15, 2012
11. Smith KL: Popular dance from ballroom to hip hop. New York: E-Book- Chelsea House. p. 7, pp. 107-110, 2010
12. Post, E. G., Simon PhD, J. E., Robison, H., Morris, S. N., & Bell, D. R. (2021). Epidemiology of overuse injuries in U.S. secondary school athletics from 2014–2015 to 2018–2019 using the National Athletic Treatment, Injury and Outcomes Network Surveillance Program. *Journal of Athletic Training*, 57(5), 510–516. https://doi.org/10.4085/1062-6050-600-20

How to cite this article: Maria Jacintha Stella, Ni Luh Nopi Andayani, I Wayan Sugiritama. Risk factors for lower extremity injuries in hip-hop dancers. *International Journal of Research and Review*. 2024; 11(4):358-362. DOI: <https://doi.org/10.52403/ijrr.20240440>
