



“PREVALENCE OF MUSCULOSKELETAL INJURY AMONG INDIAN BHARATHNATYAM DANCERS”

SUNIL K.M

Professor, SDM College of Physiotherapy.

AKSHATA NALWADE

Consultant Physiotherapist, Fortis Hospital Mumbai.

PRAMOD KSHIRASAGAR

Professor, SDM College of Physiotherapy.

PARMAR SANJAY

Professor, SDM College of Physiotherapy.

GANUKUMAR WADHOKAR

MPT student, SDM College of Physiotherapy.

ABSTRACT

Background: Dance involves various techniques require adopting anti-anatomic positions that place stress on the musculo skeletal system. Dancers involved in different dancing activities, placing them selves at a risk of musculo skeletal injuries studies have shown injuries in various dance forms. Bharathnatyam being theancient dancestyle have limited studies pertaining to musculo skeletal injuries. **Materials and Methods:** 500 professional dancers from 20 Dancing schools present in Hubli-Dharwad with minimum of three years of dancing experience were taken. The general data collection for mand the Nordic questionnaire were answered by the dancers and the data was analyzed. **Results:** Prevalence of musculo skeletal injuries in Bharath natyam dancers was found to be 36.40%with injuries most common been in the upper back, neck, shoulder, lowback, hip and wrist joint. When compared with overall prevalence of each problem there was no significance in age groups, BMI, years of dancing experience, hours of dance practice. The prevalence was found to be more in females the difference was significant ($p < 0.05$). However, the type of floor on which they practice dance was associated to prevalence of musculo skeletal injuries ($p < 0.05$). **Conclusion:** There was 36.40% prevalence of musculo skeletal injuries among Bharathnatyam dancers and the prevalence was found to be more in females the difference was significant $p < 0.05$. The type of floor on which they practice dance was associated to the prevalence of musculo skeletal injuries.

KEYWORDS : Bharathnatyam, Dance, Ballet, Musculoskeletal injuries.

INTRODUCTION

Dance involves the body, emotion and the mind, it is hence both a physical activity and a mean expression and communication. The practice of dance is combined with the artistic expression, and athletic condition in gunited in specific movements is then characterized by a precise harmonious gestures. Hence such techniques require adopting anti-anatomic positions that place stress on the musculoskeletal system. A study on dance and its association have been reported a high frequency of musculo skeletal lesions. And few injuries are even affected as a result of training practice or the competitions the frequency of practice and the duration and is hence comparable with sports injuries.²

The dance technique and the physique receive a significant attention among the dancers, the instructors, and the clinical staff. Professional dancers embody the consequences that are brought about by arigorous training to gain mastery over techniques that can repetitively risk an injury by exceeding the limits of their anatomic and physiologic capabilities. And having the knowledge about all the technical requisites of dance is also taken a significant consideration in the care of the dancer. It is important for any dance medicine practitioners to understand the bio mechanical of dance, to identify the specific demands placed on body structures and to know the pathomechanics leading to an injury.³

There are numerous studies done on musculo skeletal injuries among ballet dancers, break dancers, hiphop dancers, ballroom dancers, and jazz dancers in abroad. In all these studies they have found that there is a high prevalence of musculo skeletal injuries. Bharathnatyam is the oldest traditional dance custom in India. To best of our knowledge there is only one published article from

Chennai on analysis of lower extremity muscle flexibility among Indian classical Bharathnatyam dancers, this study never stressed the prevalence of musculo skeletal pain by using standardized scale in the Bharathnatyam dancers. The other factors such as hours of dancing practice, years of dancing proficiency, maturity of dancers, their BMI, the type of floor on which they perform which can predispose to musculo skeletal injuries has not been considered in previous study. Thus the researcher is required to assess the prevalence of musculo skeletal injuries among Bharathnatyam dancers considering the predisposing causes.

Objective of the Study:

To determine the prevalence of musculoskeletal injuries among professional Bharathnatyam dancers in Hubli-Dharwad.

Materials and methods: Standardized Nordic Questionnaire for Analysis of Musculoskeletal Symptoms, General data collection sheet, Consent form, Weighing scale, Inch tape. Inclusion Criteria: Professional Bharathnatyam dancers present in Hubli-Dharwad. Dancers who had a minimum of 3 years of dancing experience, Dancers who were of junior level and above, dancers who had an age group ranging from 13-35 years. Exclusion criteria: Dancers who had previous fracture hindering dancing, undergone any surgery, neurological deficit and medical problem, not willing to participate in the study.

Sample size: A sample of 565 dancers was taken as per the data available through 20 Dancing schools present in Hubli-Dharwad. As 65 dancers did not meet the inclusion criteria (age, and years of dancing experience) so they were excluded and only 500 dancers were included in the study. Procedure: The ethical clearance was

obtained from Sri Dharmasthala Manjuna the swara College of Medical Sciences and Hospital, Dharwad. The dancers were contacted personally in the irrespective dancing schools. They were explained about the study and the inclusion and exclusion criteria were checked. The dancers ranging from age group 13-35 years were taken for the study. They were explained about the consent form and were explained how to fill the consent form, the Nordic questionnaire, and the general data collection form which had the demographic data, BMI ,hours of dance practice, years of dancing involvement, the type of floor on which they practice dance were all taken. And the dancers who were below 18 years of age the in for med consent were taken by their parents. The data from the Nordic questionnaire was then analyzed statistically using the Chisqu are test to find the prevalence.

Results:

Table 1 Distribution of samples by age groups and gender

Age groups	Male	%	Female	%	Total	%
z13-20yrs	15	3.69	391	96.31	406	81.20
21-30yrs	10	12.05	73	87.95	83	16.60
31+yrs	2	18.18	9	81.82	11	2.20
Total	27	5.40	473	94.60	500	100.00

Table 2 Distribution of samples by BMI groups and gender

BMI	Male	%	Female	%	Total	%
Under weight	3	2.42	121	97.58	124	24.80
Normal	22	6.77	303	93.23	325	65.00
Over weight	2	4.26	45	95.74	47	9.40
Obese	0	0.00	4	100.00	4	0.80
Total	27	5.40	473	94.60	500	100.00

Table 3 Compar is on of prevalence of each problems in male and females (Q1)

Problems	Male	%	Female	%	Total	%	Z-value	p-value
Neck	4	14.81	22	4.65	26	5.20	-2.3110	0.0210*
Shoulder	2	7.41	14	2.96	16	3.20	-1.2760	0.2020
Elbows	2	7.41	9	1.90	11	2.20	-1.8950	0.0580
Wrists/ hands	4	14.81	7	1.48	11	2.20	-4.5900	0.0000*
Upper back	2	7.41	18	3.81	20	4.00	-0.9280	0.3530
Low back	3	11.11	10	2.11	13	2.60	-2.8540	0.0040*
1/both hips	3	11.11	9	1.90	12	2.40	-3.0380	0.0020*
1/both knees	1	3.70	36	7.61	37	7.40	-0.7540	0.4510
1/both ankles	2	7.41	21	4.44	23	4.60	-0.7150	0.4740

*p<0.05

Table 4 Compar is on of prevalence of each problems in male and females (Q2)

Problems	Male	%	Female	%	Total	%	Z-value	p-value
Neck	3	11.11	16	3.38	19	3.80	-2.0410	0.0410*
Shoulder	2	7.41	3	0.63	5	1.00	-3.4370	0.0010*
Elbows	0	0.00	3	0.63	3	0.60	-0.4150	0.6780
Wrists/ha nds	3	11.11	2	0.42	5	1.00	-5.4240	0.0000*
Upper back	2	7.41	7	1.48	9	1.80	-2.2510	0.0240*
Low back	1	3.70	3	0.63	4	0.80	-1.7400	0.0820
1/both hips	2	7.41	6	1.27	8	1.60	-2.4700	0.0140*
1/both knees	1	3.70	10	2.11	11	2.20	-0.5470	0.5840
1/both ankles	1	3.70	12	2.54	13	2.60	-0.3700	0.7110

*p<0.05

Table 5 Comparison of prevalence of each problems in male and females (Q3)

Problems	Male	%	Female	%	Total	%	Z-value	p-value
Neck	1	3.70	1	0.21	2	0.40	-2.7930	0.0050*
Shoulder	2	7.41	3	0.63	5	1.00	-3.4370	0.0010*
Elbows	1	3.70	4	0.85	5	1.00	-1.4500	0.1470
Wrists/hands	2	7.41	5	1.06	7	1.40	-2.7290	0.0060*
Upper back	3	11.11	7	1.48	10	2.00	-3.4730	0.0010*
Low back	2	7.41	7	1.48	9	1.80	-2.2510	0.0240*
1/both hips	1	3.70	11	2.33	12	2.40	-0.4550	0.6490
1/both knees	1	3.70	6	1.27	7	1.40	-1.0460	0.2950
1/both ankles	2	7.41	13	2.75	15	3.00	-1.3790	0.1680

*p<0.05

Discussion: In our survey 500 professional dancers were included from the age of 13 to 35 years with minimum 3 years of dancing experience, and who met the inclusion and exclusion criteria. The dancers were recruited from 20 dancing schools present in Hubli-Dharwad. Table 1 explains the distribution of the samples by age groups and gender. There were total 500 dancers. The total percentage of males was 5.40% (27) and percentage of females was 94.6% (473). In the age group of 13-20 years the total percentage of dancers was 81.20% (406) in which males were 3.69% (15) and females were 96.31% (391). In the age group of 21-30 years the total percentage was 16.60% (83) in which males were 12.05% (10) and females were 87.9% (73). In the age group of 31-35 years the total percentage was 2.20% (11) in which males were 18.18% (2) and females were 81.82% (9). Table 2 explains the distribution of samples by BMI groups and gender the total percentage in males 5.40% (27) and total percentage in females 94.60% (473).

Further more, the Nordic questionnaire is sub divided into three parts; Q1-musculo skeletal pain before one year, Q2-within one year and Q3- in past seven days.

Table 3 explains the comparison of prevalence of each problem in male and female in respect to Q1 of the Nordic questionnaire mentioned above. The total percentage of dancers who had neck problem were 5.20% (26) in which male were 14.81% (4) and female were 4.65% (22). The total percentage of dancers who had shoulder problem were 3.20% (16) in which male were 7.41% (2) and female were 2.96% (14). The total percentage of dancers who had elbow problem were 2.20% (11) in which male were 7.41% (2) and female were 1.90% (9). The total percentage of dancers who had wrist/hands problem were 2.20% (11) in which male were 14.81% (4) and female were 1.48% (7). The total percentage of dancers who had upper back problem were 4.00% (20) in which male were 7.41% (2) and female were 3.81% (18). The total percentage of dancers who had one or both hips problem were 2.40% (12) in which male were 11.11% (3) and female were 1.90% (9). The total percentage of dancers who had one or both knees problem were 2.40% (12) in which male were 3.70% (1) and female were 7.61% (36). The total percentage of dancers who had one or both ankles were 4.60% (23) in which male were 7.41% (2) and female were 4.44% (21). In our study we found neck, wrists /hands, low back, and hip problems to be significant with p<0.05.

Table 4 explains the comparison of prevalence of each problem in male and female in respect to Q2 of the Nordic questionnaire mentioned above. The total percentage of dancers who had neck problem were 3.80% (19) in which male were 11.11% (3) and female were 3.38% (16). The total percentage of dancers who had shoulder problem was 1.00% (5) in which male were 7.41% (2) and female were 0.63% (3). The total percentage of dancers who had elbow problem was 0.60% (3) in which male were 0.00% (0) and female were 0.63% (3). The total percentage of dancers who had wrist/hands problem was 1.00% (5) in which male were 11.11% (3) and female were 0.42% (2). The total percentage of dancers who had upper back problem were 1.80% (9) in which male were 7.41%

(2)and female were 1.48%(7).The total percentage of dancers who had low back problem was 0.80 % (4) in which male were3.70 % (1) and female were 0.63 % (3).The total percentage of dancers who had one or both hips problemwas1.60 % (8)in which male were7.41 % (2)and female were 1.27 % (6).The total percentage of dancers who had one or bothknees problem were 2.20 % (11)in which male were 3.70 % (1)and female were 2.11 % (10). The total percentage of dancers who had one or bothankles problem were 2.60 % (13)in which male were 3.70 % (1)and female were2.54 % (12).Inour study we found neck, shoulder, wrist/hands,upper back, one or both hips to be significant with $p < 0.05$.

Table5 explains the comparis on of each problems in male and females in respect to Q3 of the Nordic questionnaire mentioned above. The total percentage of dancers who had neck problem was0.40 % (2)in which male were3.70 % (1) and female were 0.21 % (1).The total percentage of dancers who had shoulder problem was1.00 % (5)in which male were 7.41 % (2)and female were 0.63 % (3).The total percentage of dancers who had elbow problem was 1.00 % (5) in which male were 3.70 % (1)and female were 0.85 % (4). The total percentage of dancers who had wrist/hands problem was1.40 % (7)inwhichmalewere7.41 % (2)andfemaleswere 1.06 % (5).The total percentage of dancers who had upper back problem were 2.00 % (10) in which male were 11.11 % (3)and female were 1.48 % (7).The total percentage of dancers who had low back problem was1.80 % (9)in which male were7.41 % (2)and female were 1.48 % (7).The total percentage of dancers who had one or both hips problem were 2.40 % (12)in which male were 3.70 % (1)and female were2.33 % (11). The total percentage of dancers who had one or bothknees problem was1.40 % (7)in which male were 3.70 % (1) and female were1.27 % (6). The total percentage of dancers who had one or bothankles problem were 3.00 % (15) in which male were7.41 % (2)and female were2.75 % (13).In our study we found neck, shoulder wrists/hands, upper back, low back to be significant with $p < 0.05$.

In our study the majority of body regions complaint, the overall injury incidence that was found among 500 Bharathnatyam dancers were Neck 9.4%(47), Shoulder 5.20% (26), Elbow 4.60% (23), wrist/hand 4.60%(23), Upper back 7.8%(39), Low back 5.2%(26), Hip 6.4%(32), Knee, 11.00%(55),Ankle10.2%(51).

Conclusion: The finding from this study reveals that there is prevalence of musculo skeletal injuries among Bharathnatyam dancers and the prevalence were found to be36.40% in 500 study subjects. The affection of body area is as follows neck 9.4%(47), shoulder 5.20%(26), elbow 4.60% (23),wrist/hand4.60%(23),upper back7.8%(39),lowback5.2%(26),hip 6.4%(32),knee11.00%(55), ankle10.2%(51).

Conflict of interest:None.

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