

# THE EXAMINATION OF KNEE PROPRIOCEPTION AND JOINT POSITION SENSE AMONG TURKISH BLACK SEA FOLK DANCES PERFORMERS



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## Introduction

The Horon, a type of Turkish Black Sea Folk Dance involves with intense and short duration (anaerobic) of movement elements including, knee flexion-extension, alternating fast foot tappings, shaking of the shoulders, trunk and the whole body (Unal & Anliatamer, 2000). The duration of each element is about 1.10-1.15sec and the Horon is not longer than 10minutes. Thus, strength, agility, coordination, high speed, endurance are needed.

## Purpose

Examination of proprioception features and observation of position sense of the knees of Anatolian Black Sea Region Folk (BSRF) dancers during their fast and coordinated knee extension and flexion movements while dancing.

## Participants

The participants were 20 folk dancers having at least three years of professional experience and 20 sedentaries.

|                   | Age (years) | BMI (kg/m <sup>2</sup> ) | Experience in dance            |
|-------------------|-------------|--------------------------|--------------------------------|
| Dancers n=20      | 28,85±5,55  | 22,02±1,58               | At least 3 years of experience |
| Sedentaries* n=20 | 26±3,73     | 23,97±2,73               | -                              |

\* College students: Medicine and Physiotherapy

Table 1. Dancing experience and the physical features of the participants.

## Methods

Their physical and antropometric features, muscle shortenings, range of motion, joint position sense and explosive strength were measured.

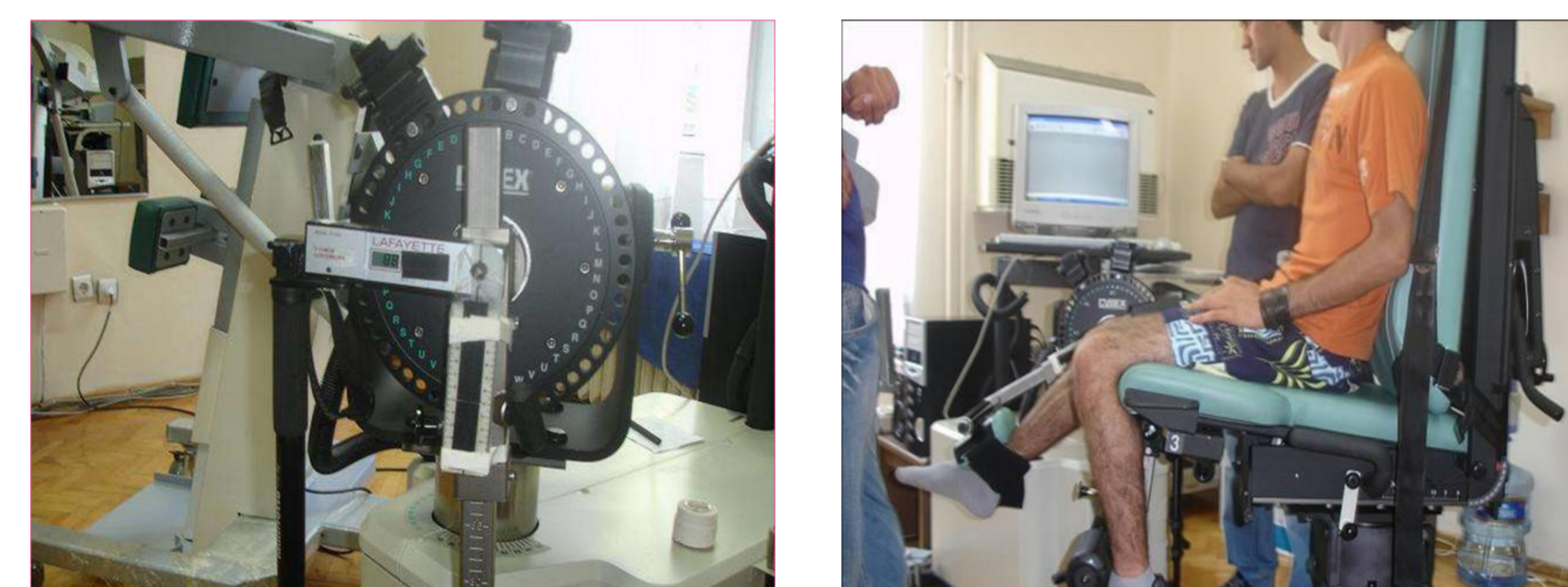


Figure 1-2. Joint position sense & explosive strength.



## Results

The left knee extension (p=0.000) and right knee flexion (p=0.02) ranges were wider in the favour of the dancers (p<0.01) and (p<0.05) respectively. In other words, the hypermobility was observed in the left knee extension and right knee flexion of the dancers. However, their explosive strength was found higher than the sedentaries (p≤0,05).

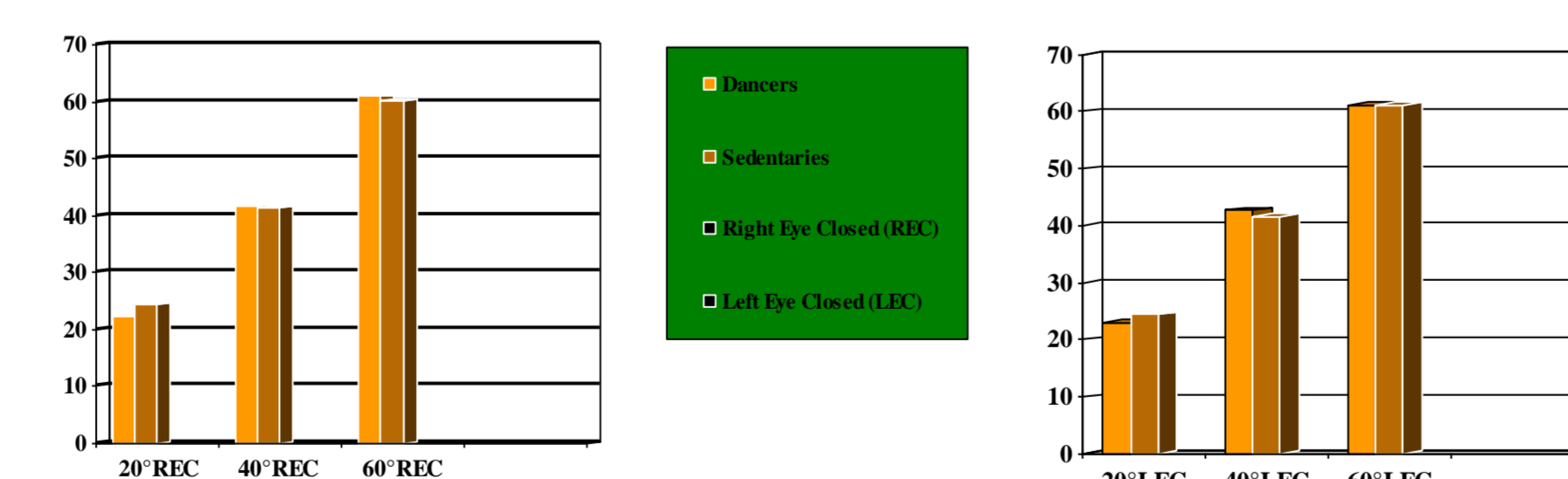


Figure 3. Error of matching of the participants according to the proprioceptive assessment of the knee joints without visual feedback.

The mean error of matching of the dancers (1.95±2.91 degrees) were significantly less than the sedentaries (4.2±3.02 degrees), (p=0.021). However, the proprioceptive accuracy of the right side knee joint extension at 20° with (r=0.700, p=0.000) and without (r= 0.646, p= 0.000) visual feedback were significant in the favour of the dancers.

Additionally, dancing years of experience was found related with the right (r= 0.646 ,p=0.00) and left side accuracy (r=0.896, p=0.000) at 20°, as well as, right side knee extension at 60° (r=0.380, p= 0.015) without visual feedback.

Thight left knee flexors were found negatively related with the proprioceptive accuracy at 20° with (r=-0.400, p=0.011) and without (r=- 0.403, p=0.010) visual effect. However, the thight right knee flexors were negatively related with the proprioceptive accuracy at 20° (r=-0.432, p=0.005) and 40°(r=-0.437, p=0.005) while eyes open.

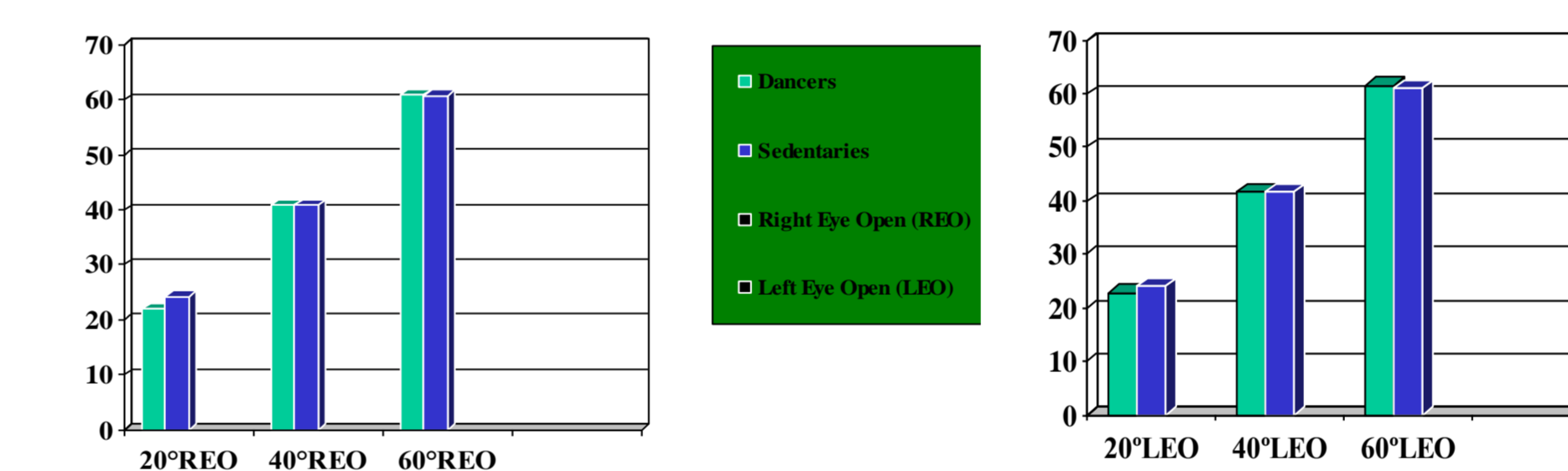


Figure 4. Error of matching of the participants according to the proprioceptive assessment of the knee joints with visual feedback.

## Discussion & Conclusions

With this study we aimed to observe the knee joint proprioception sense of the Black Sea Region folk dancers and also to introduce this national dance which have highly significant rapid movements of the lower extremities into the national and international literature. Otken (2002) have stated that while performing a Horon dance the involvement of the body parts to the dance figures may differe as trunk 50%, neck 60%, shoulders 85%, knees, elbows and hands 100%, hips 57% and ankles 50%. The importance of this groupe dance is to exhibit the same figures by the each body part and the joints. The fast and coordinated flexion-extension movements of the knees in different degrees while the other leg is tiptoe standing and jumping and the other parts of the body is shaking accordingly, is the most astonishing feature of the dance (Unal & Anliatamer, 2000)

According to our observation during a sample performance of the whole dance groupe, the frequency of the leg swings which were alternating fleksion-extensions of the knee joints

were 57 times on the right and 33 times on the left side in a minute. Although there is a limited national literature, this outcome may exhibite the idea that during the performance, the left leg is mostly for weight-bearing and the right is mostly to perform the figures.

Thus, the significant higher knee extension range in left side of the dancers (p=0,020) may be due to the supporting role of the left leg during the performance. The other important data of this study was the higher flexibility degree of hamstring and hip flexor muscles. Therefore, the knee joint injuries especially in left side may be suggestable for the future studies.

Although the mean error of matching of the dancers was significantly less than the sedantaries, the proprioceptive accuracy of the right knee joint in extension was higher only at 20° among dancers. The explosive strength values were significantly higher among the dancers. This may be related with the plyometric exercises in their regular training program. Therefore, we may suggets proprioceptive exercises to improve their proprioceptive sense and to provide the preventive measures.

## References

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