Foot Posture Distortions Observed in Wrestlers

Celal Taskiran, Mahmut Açak & Mehmet Fatih Korkmaz


To link to this article: https://doi.org/10.1080/21615667.2017.1341570

Published online: 13 Mar 2018.
Foot Posture Distortions Observed in Wrestlers

Celal Taskiran,1 Mahmut Açak,1 and Mehmet Fatih Korkmaz1

ABSTRACT. The aim of this study is to investigate the foot postures of wrestlers between the ages of the ages of 11–21. A total of 685 athletes participated in the study. Sole measurements were conducted by a photographic imaging device and the Staheli index was employed. As a result of the conducted study, it was concluded that foot posture distortion of new candidate wrestlers was 10.6%, active free wrestlers was 25.7%, and active Greco-Roman wrestlers was 15.6%. It was also observed that there were significant differences in the statistical comparisons of every group.

Keywords: wrestling, pes planus, posture distortion

INTRODUCTION

Sport is known as one of the most important tools in improving body, soul, and social health of individuals. Sports, in addition to being practiced for health, is practiced to achieve high levels of success in high-performance sports. The main goal for success in a performance sport is to have appropriate physical and physiological features for the practiced sport, as much as the athlete’s talent. In a review of sports studies, it is observed that the number of studies discussing physical and physiological features of various sport subdivisions are increasing every day.

Physical structures formed due to the movements in different sport subdivisions differ from each other in terms of both posture features and anthropometric features (Elliott, 1998). Studies report that sport subdivisions demonstrate differences in postural forms (Uetake & Ohtsuki, 1993). Wrestling is a performance sport and it requires one to be physically healthy and balanced in addition to features such as physiological, psychological, technical, tactical, strength, and agility. Among these features, balance has a different aspect in wrestling. Foot posture plays an important role in maintaining balance.

Pes planus, which distorts foot posture, is a foot deformation that is characterized by the inner longitudinal arch’s disappearance and the heel’s outer movement (Öğüt, 2017). Medically, pes planus, expressed as flat feet, is the flattening or disappearance of one of the longitudinal or transverse arches. This condition rules out the springiness of the foot and obstructs normal movements during walking or running. In another expression, pes planus is defined as when the “foot’s medial longitudinal arch’s heights decrease or the deformation caused by its total collapse” (Lee et al., 2005, p. 78). Pes planus disorder is characterized by the foot arch’s flatness in the medial part and the contact of the whole foot with the ground. The reason for this disease, which usually does not cause pain, may be the nonformation of foot arches in childhood (Enriqué, Sánchez, Posada, Molano, & Guevara, 2012). The rate of pes planus in 3-year-old children is 44%, whereas it decreases to 24% in 6-year-old children (Pfeiffer, Kotz, Ledl, Hauser, & Sluga, 2006). However, Daneshmandi, Rahnama, and Mehdizadeh (2009) reported a meaningful relationship between obesity and pes planus.

Pes planus has two clinical forms: flexible and rigid pes planus. One of the basic applications suggested for individuals with pes planus is using an insock (insole). In pes planus treatment, various types of orthosis are used depending on the severity of the deformation and symptoms (Banwell, Mackintosh, & Thewlis, 2014; Lee et al., 2005).

Manufactured insocks with steel arches and leather surfaces and including shock absorbent material such as silicon or semi-rubber are frequently suggested to patients by doctors (Kulcu, Yavuzer, Sarmer, & Ergin, 2007). Otman (1984) and Yurt (2015) reported that the arch support in pes planus subjects reduced pain, and they fatigued later than usual following insock use. Nevertheless, it is known that the insocks’ height does not mimic the standard arch’s height but is used with the only aim being of relieving the pain in the foot.
Wrestling was first practiced on a dirt surface with bare feet in the first modern Olympics in Athens in 1896 (see Figure 1); later, it was practiced on thick and soft mats and with leather shoes that the cover ankles tightly in London in 1908 (see Figure 2; “1896 Summer Olympics,” 2017). The wrestling shoes currently used have preserved many of the same features. Wrestling shoes do not have any elevation in their heels and thus do not contain an orthopedic insock.

As a result of the literature review, it was observed that there is no study on foot posture distortions of wrestlers in the wrestling subdivisions. It was also observed that the officially worn wrestling shoes do not have a heel elevation nor an orthopedic support in the center and they are tied tightly. This condition causes posture distortions on the soles of the wrestlers, and this condition constitutes the topic of our study. For this reason, the aim of this study is to detect the foot posture distortions among wrestlers using incorrect shoes and the effects of wrestling mats and practice styles and we put forward ideas about the causes.
MATERIAL AND METHOD

The study was developed according to a survey model of quantitative research methods. The model of the study is a descriptive survey model owing its aim to determine the current situation by quantitative analysis of the data acquired by a survey of wrestlers’ tendency towards pes planus.

Two hundred and sixteen candidate wrestlers who had just started wrestling and were at the age of 11 years, 245 active freestyle wrestlers between 17–21 years old from the categories of stars and youth, and 224 active Greco-Roman wrestlers participated in the study, which constitutes a total of 685 athletes.

In order to detect and evaluate the general structure of the foot, footprint parameters were used (Forriol & Pascual, 1990; Waldecker, 2004). In our study, the Staheli Index (Staheli, Chew, & Corbett, 1987), which has a high validity, was employed. Body Mass Index (BMI) was formulated using anthropometric measurements by proportioning the body weight with height (weight [kg] /height$^2$ [m$^2$]). Statistical Package for the Social Sciences (SPSS version 21.0, IBM, New York, USA) software was used in the analysis of the data acquired within the extent of this study. Percentages and standard errors of all measured parameters of the subjects were calculated. The determination of the difference among the groups was analyzed by the chi-square method.

FINDINGS

Two hundred and sixteen new candidate wrestlers aged around 11 years, 245 active freestyle wrestlers, 33 of whom are from the Olympic Reserve team, and 224 active Greco-Roman wrestlers, 16 of whom are from the Olympic Reserve team, participated in the study, which constitutes a total of 685 athletes.

The pes planus rate for 12-year-olds and younger wrestlers is 11.7%, for 13- to 16-year-olds, it is 15.7%, and for 17- to 21-year-olds, it is 26.7% (see Table 1). In the chi-square test, a meaningful relationship was observed between the age of the wrestlers and their pes planus state, $X^2(df = 2, n = 685) = 18.233, p < .05$.


table 1 pes planus percentage of wrestlers in terms of age

<table>
<thead>
<tr>
<th>Age</th>
<th>Not Present</th>
<th>Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 years old and younger</td>
<td>212 88.3</td>
<td>28 11.7</td>
</tr>
<tr>
<td>13-16 years old</td>
<td>198 84.3</td>
<td>37 15.7</td>
</tr>
<tr>
<td>17-21 years old</td>
<td>154 73.3</td>
<td>56 26.7</td>
</tr>
<tr>
<td>Total</td>
<td>564 82.3</td>
<td>121 17.7</td>
</tr>
</tbody>
</table>

Note. $X^2(df = 2, n = 685) = 18.233, p = .000$.

According to the years that the subjects practiced wrestling as shown in Table 2, the pes planus rate for athletes practicing wrestling for less than 5 years is 9.9%, for 6–10 years, it is 24.1%, and for more than 11 years, it was 35.3%. In the conducted chi-square test, a meaningful relationship was observed between the athletes’ years of practicing wrestling and their pes planus state, $X^2(df = 2, n = 685) = 64.454, p < .05$.

According to the style of wrestling as shown in Table 3, the pes planus rate of freestyle wrestlers was 25.7% and, for Greco-Roman wrestlers, it was 15.6%. In the conducted chi-square test, a meaningful relationship was observed between athletes’ wrestling style and their pes planus state, $X^2(df = 2, n = 685) = 18.868, p < .05$.

table 2 pes planus percentage of wrestlers in terms of years practiced wrestling

<table>
<thead>
<tr>
<th>Years in the Sports</th>
<th>n</th>
<th>%</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 5 years</td>
<td>337</td>
<td>90.1</td>
<td>37</td>
<td>9.9</td>
</tr>
<tr>
<td>6–10 years</td>
<td>223</td>
<td>75.9</td>
<td>71</td>
<td>24.1</td>
</tr>
<tr>
<td>More than 11 years</td>
<td>11</td>
<td>64.7</td>
<td>6</td>
<td>35.3</td>
</tr>
<tr>
<td>Total</td>
<td>564</td>
<td>82.3</td>
<td>121</td>
<td>17.7</td>
</tr>
</tbody>
</table>

Note. $X^2(df = 2, n = 685) = 64.454. p = .000$.

table 3 pes planus percentage of wrestlers in terms of style of wrestling

<table>
<thead>
<tr>
<th>Style</th>
<th>n</th>
<th>%</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freestyle</td>
<td>182</td>
<td>74.3</td>
<td>63</td>
<td>25.7</td>
</tr>
<tr>
<td>Greco-Roman</td>
<td>189</td>
<td>84.4</td>
<td>35</td>
<td>15.6</td>
</tr>
<tr>
<td>Just started wrestling</td>
<td>193</td>
<td>89.4</td>
<td>23</td>
<td>10.6</td>
</tr>
<tr>
<td>Total</td>
<td>564</td>
<td>82.3</td>
<td>121</td>
<td>17.7</td>
</tr>
</tbody>
</table>

Note. $X^2(df = 2, n = 685) = 18.868, p = .000$.

DISCUSSION

In this study, foot postures of athletes who range from 11 years old candidate wrestlers to 21 years old active wrestlers and the reasons for forming posture distortions were investigated. In light of the acquired statistical data, for the effects of years practicing wrestling on pes planus, it was observed that 37 athletes (9.9%) out of 374, who are 11 years old and practicing the sport for 5 years or less had pes planus while 71 athletes (24.1%) out of 294 athletes, who have been practicing wrestling between 6–10 years had pes planus, and 13 athletes (76.5%) out of 17 athletes, who have been practicing wrestling for more than 11 years had pes
planus. In the conducted chi-square test, a meaningful relationship was observed between the age of wrestlers and their pes planus state, $X^2(df = 2, n = 685) = 18.233, p < .05$.

In the comparison of the number of years practicing wrestling for 5 years, 6–10 years, and more than 11 years, a statistically meaningful difference was observed. According to this situation, the pes planus rates of wrestlers increases with increased years of practicing wrestling.

In the investigation of whether a statistically meaningful difference is present among freestyle wrestlers and Greco-Roman wrestlers, it was observed that 25.7% of freestyle wrestlers out of 245 had pes planus and 15.6% of Greco-Roman wrestlers out of 224 had pes planus. Thus, it was determined that there was a statistically meaningful difference on behalf of freestyle wrestlers.

In the conducted studies, it was reported that individuals with pes planus experienced pain in activities such as standing (Kızılçel, 2010), walking, and running (Lee et al., 2005), and Violante et al. (2004) and Oskay and Yakut (2011) suggested in their studies that there was a positive relationship between individuals’ pes planus and waist pain. Considering these findings, it can be suggested that pes planus in wrestlers present an important problem. This is due to failure of the longitudinal arch in absorbing the shock created while carrying the weight of the body during locomotion and also by causing difficulties during flexion of the foot during walking and running. In pes planus, it is also a fact that the lower position of the navicular bone and posterior tibial tendon’s major loss of ability to stress and flex will cause a restraint for wrestlers to rise on their tiptoes and to flex in practicing techniques of passing over and will pose a challenge in the successful execution of the technique.

In addition, Kaufman, Brodine, Shaffer, Johnson, and Cullison (1999) reported in their study that pes planus caused pain sensitivity in the foot, hardness, analgesic walking, an imbalance in the foot muscles, tension in the ligaments, quickly fatiguing while walking, and in the formation of stress fractures. Wojtys, Ashton-Miller, Huston, and Moga (2000) reported that intense exercise practiced since childhood had effects on posture. Since wrestlers are required to practice running, cross-training, and weight-lifting exercises to improve their condition, pes planus presents a serious disadvantage.

Wrestling requires disturbing the balance of the opponent in order to defeat him or her, to prepare for techniques, and to wear down the opponent. Within this context, imbalanced movements are fundamental techniques in wrestling. While a wrestler stays balanced, he or she is required to disturb the balance of one’s opponent. Wrestlers with pes planus may have a balance problem compared to wrestlers without pes planus and this may lead to significant performance loss.

**CONCLUSION**

According to the results of the conducted study, it was concluded that with the increasing years of wrestlers, their pes planus rates also increase, freestyle wrestlers have a higher tendency to pes planus compared to Greco-Roman wrestlers, and athletes with pes planus have a higher BMI. The reason for this may be the fact that freestyle wrestlers have a higher rate of wrestling in bare feet in cultural wrestling, Karakucak, and grease wrestling, tightly tied wrestling shoes, equal heights on the front and back of the wrestling shoes, the lack of an orthopedic insock, and the stepping towards the inside of the foot in order to balance the center of the body by leaning forward.

**SUGGESTIONS**

The following suggestions can be made in light of the acquired data in the study:

- Wrestling shoes should be redesigned.
- The heels of wrestling shoes should be elevated compared to their front such as in sneakers and daily shoes.
- All wrestling shoes should include orthopedic insocks.
- Wrestlers should wear regular sneakers during non-wrestling exercises such as warming up, running, movements, educational and sports games, etc.

**REFERENCES**


Oskay, D., & Yakut, Y. (2011). Bel ağrısı olan ve olmayan kadınların Fiziksel Uygunluk Parametrelerinin Karşılaştırılması [Comparison of
physical fitness parameters of women with and without low back pain].


Yurt, Y. (2015). Cad/Cam ve Geleneksel Yöntemlerle Üretilmiş İki Farklı Tabanlık Uygarlamanın, Ağrılı Esnek Düz Tabanlı Bireylerde Ağırlık Kalitesi ve Fiziksel Performans [Comparison of the effects of Cad / Cam and two different orthotics produced by traditional methods on pain, quality of life and physical performance in painful flexible flat-footed individuals]. Hacettepe University Institute of Health Sciences, Prosthetics-Orthotics and Biomechanics program, PhD thesis.