INJURY PROFILE OF THE MOUNTAIN RUNNER: GENDER COMPARISON

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Abstract: The number of events and distances in mountain races has grown exponentially. Meanwhile, the number of runners has also increased considerably. The increased participation in mountain races has resulted in an increase in runner injuries. This research is aimed at analysing and comparing (men vs. women) experience time, training time, and the injuries sustained during the practice of this sport. The sample (n=306) was made up of men (n=261) and women (n=45) who participated in the Canfranc - Canfranc Race (Spain). The instrument used is the Runner´s Profile and Propensity to Sports Injury questionnaire. There were no significant differences (p=0.01) between male and female variables: years of running experience, years of mountain running experience, training hours and time per week, and injuries in the previous three years and three months. Further research is required to analyse and compare male and female runners at different distances and mountain races.

Keywords: mountain races, gender, injury.

INTRODUCTION

The number of participants in mountain races of all sorts of distances keeps growing considerably (Martínez-Navarro et al., 2020). The Ultra Trail du Mont Blanc (UTMB), the Sables Marathon or the Western States Endurance Run in USA are clear examples of this (Scheer, 2019). The increasing status of this kind of races has aroused the attention and interest of the scientific community which aims to analyse the physical effort and its potential several consequences in health (Scheer et al., 2020).

Due to the growing number of competitions and distances of this kind of races, the number of injured athletes is also increasing. As a result, the profile of the injured runner and its propensity to suffer an accident during the practise is being studied (Babí et al., 2017).

In this sense, variables like age, gender, experience in mountain races, weekly training hours and number of suffered injuries ought to be analysed in order to establish possible casuistry (Babí et al., 2017).

Thus, the aim of this study is to analyse and compare the injury index in a sample of male and female runners who have taken part in a mountain running

event. Besides, it has been studied it´s relation with the following variables: years of experience in mountain races, dedicated time to training, gender and age.

MATERIALS AND METHODS
The race
"Canfranc-Canfranc" (Huesca, Spain) is a competition held in the Pyrenees (mountains range between Spain and France). This running event offers the possibility to participate in different distances: vertical kilometre, 16k, 45k, 70k and 100k. The relation between the race distances and their positive slope is summarized in the following table (table 1).

Table 1 Description of the analysed race´s distances and positive slopes

Race distance (kms)	Positive elevation gain (m)
VK	927
16	1600
45	4000
70	6100
100	8848

Legend: VK - Vertical Kilometer.

Participants
306 mountain runners (261 male and 45 female) compose the analysed sample. The following descriptive variables were studied: age, years of experience in endurance races, years of experience in mountain races, number of weekly training sessions and number of weekly training hours in the last three months, number of injuries in the last three years and number of injuries in the last six months (table 2).

Table 2 Analysed variables and sample´s descriptive values.

Variables	AVG-SD
Age (years)	39.3±9.2
Run experience (years)	12.0±9.1
Mountain races experience (years)	7.1±5.5
Sessions week last 3 month (nº)	4.2±2.1
Hours training week last 3 month (h)	8.4±4.4
Injury last 3 years (nº)	1.4±0.5
Injury last 6 month (nº)	1.7±0.4

Measurements and evaluation
Studied variables were measured from a validated questionnaire: Runner´s profile and propensity to sports injury questionnaire (Babí et al., 2017). This study has been approved by the ethical committee of the Aragon Government (Spain) with the following expedient number: 14/2022. Participants completed the questionnaire via Google-Form® and all of them gave their consent to the development of the study. An e-mail was provided to resolve any issue they could have had during the process. Once all the answers were collected, they were downloaded to an Excel page v. 2010 (Microsoft©).

Statistical analysis

A descriptive analysis of the variables was performed based on the mean and the standard deviation (SD). The Shapiro-Wilk test was performed to analyse the normality of the distribution and the Levene test to determine homogeneity. Student's t was applied in order to determine the differences between groups.

RESULTS

Men had more experience in comparison with women not only in endurance races but also in mountain races, although they were not found significative differences. Furthermore, women trained more hours weekly, but with no significative differences neither. Both male and female runners have suffered injuries in a similar way during last six months (table 3).

Table 3 Analysed variables: Comparison between male and female.

Gender	Run experience (years)	Run mountain experience (years)	Hours Week Training last 3 mounth (h)	Injury last 3 years (nº)	Injury last 6 mounth (nº)
Male	12.5±9.6	7.4±6.2	8.4±4.7	1.5±0.5	1.7±0.4
Female	9.8±6.9	5.7±3.9	9.3±4.1	1.4±0.5	1.7±0.4

On the other hand, taking different race's distances into account, analysed variables between gender gave the following results: 100k race is the race in which eldest male participants have been seen (47±2.9 years), unlike the oldest women who were in the 45k race (47±6.2 years).

Additionally, no significative differences have been found in none of the analysed variables when comparing male and female in the longer distance race (table 4). In this sense, male category shows a higher age, a longer experience in endurance sports and mountain races, in weekly training hours and in number of injuries in the last six months.

Table 4 Analysed variables vs. Race distances (male)

Age (years)	Distance (km)	Run experience (years)	Run mountain experience (years)	Hours Week Training last 3 mounth (h)	Injury last 3 years (nº)	Injury last 6 mounth (nº)
37.3±10.6	VK	9.8±8.5	4.0±3.0	3.7±1.9	1.5±0.5	1.8±0.4
39.8±9.4	16	12.6±9.7	7.8±6.2	4.4±3.7	1.5±0.5	1.7±0.5
35.3±8.5	45	11.7±8.2	7.5±5.9	3.7±2.4	1.2±0.5	1.5±0.4
42.4±6.9	70	14.8±7.5	10.2±4.1	4.4±2.6	1.5±0.5	1.7±0.4
47.0±2.9	100	17.3±6.5	11.3±7.0	4.5±1.9	1.3±0.5	1.8±0.5

Finally, women-wise, participants in the 45k race have shown the higher previous experience in mountain races. However, weekly training hours are larger in women that raced the 70k, where it can be seen the highest injury values as well (table 5).

Table 5 Analysed variables vs. Race distances (female)

Age (years)	Distance (km)	Run experience (years)	Run mountain experience (years)	Hours Week Training last 3 mounth (h)	Injury last 3 years (nº)	Injury last 6 mounth (nº)
33.6±9.0	VK	7.1±5.3	3.7±3.1	3.6±2.1	1.5±0.5	1.8±0.4
41.5±5.2	16	12.9±7.4	7.2±3.6	4.1±3.4	1.4±0.5	1.7±0.5
47.0±6.2	45	12.5±3.5	11.5±2.1	4.5±2.8	1.0±0.1	1.5±0.7
40.0±6.1	70	9.0±3.5	6.3±2.2	5.8±5.3	1.8±0.5	2.0±0.1
30.3±2.5	100	6.3±2.9	5.7±4.0	4.0±3.8	1.0±0.1	1.7±0.6

DISCUSSION

The average age of the runners who participated in the study (39.3 ± 9.2 vs. 38.3 ± 8.3 years) is similar to that of other research conducted in ultra trail races (Babí et al., 2017). It is common to see that the longer the distance of the race is the higher the average age of the participants.

Concurrently, male runners analysed in the 100k race showed the greatest experience (17.3 ± 6.5 years) in both long-distance races and in mountain races. Although, female athletes had more training experience in 16 and 45k races (12.9 ± 2.4 y 12.5 ± 3.5 years, respectively). One of the reasons explaining this difference, could be the gradual inclusion of women in these types of events (Rosales et al., 2018) since as women become more involved into the mountain races, the duration of the races in which they compete increases in parallel (Stöhr et al., 2021).

However, no statically significant differences have been found between male and female runners analysed in following variables: run experience, run mountain experience, hours week training in the last three months and injury in the last three years or in the last six months.

Finally, regarding the injury rate in last six months before the event, it has been similar between men and women (1.8 ± 0.5 vs. 1.7 ± 0.6 respectively). This value is consistent with other research findings (Fordham et al., 2004). In this regard, it appears that there is a positive correlation between the weekly training hours and the race distance in the risk of injury (Vílchez, 2010). Both male and female runners who have trained more hours had a higher injury rate in the six months leading to the event (Rosendo & Puga, 2015).

CONCLUSIONS

This study reveals that the average age of participants in long mountain races is still higher in male runners which aligns with findings form prior research. In addition to this, male runners in the 100k race exhibit greater overall experience, while female runners did in the 16 and 45k races. This gender-based discrepancy could be attributed to the gradual integration of women into this type of events.

Although no statistically significant differences were observed among male and female runners, a positive correlation between weekly training hours, running distance and injury risk leads us to think that further research is needed.

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