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Incidence of Injuries in Collegiate Cross Country

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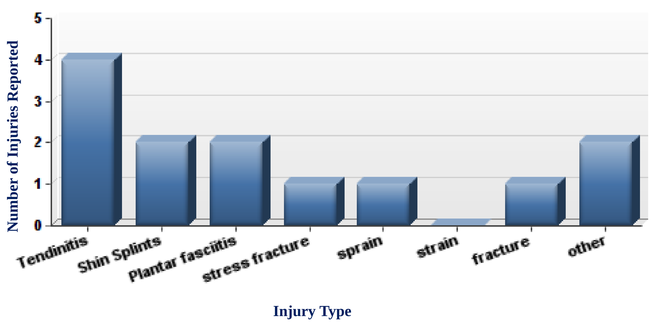
ABSTRACT

Running is becoming increasingly popular not only recreationally, but also competitively. With the increase in the number of runners comes an increase in the number of people who are injured. The purpose of this study was to determine if increasing mileage would result in a greater prevalence in injuries among collegiate cross country runners. Participants for this study included cross-country runners in the NCAA Division II Great Midwest Athletic Conference. The hypothesis for this study had two parts: the greatest increase in mileage would be seen between the senior year of high school and the freshmen year of college; and the greatest increase in injuries would be seen during this time as well. The study was conducted through an online survey in which participants were asked questions pertaining to their running history as well as injury history. All data was collected and stored online; quantitative data was evaluated using SPSS software and qualitative data was evaluated for themes. A one-way ANOVA test revealed statistically significant differences between the number of years running and whether or not they participated in weight training during high school (p .003). No increase in injury prevalence was associated with increased mileage in this study. The goal of this study was to be able to better educate runners on the risk factors associated with distance running and to add to the pool of research on running related injuries.

INTRODUCTION

Running, either on a competitive level or just recreationally, is very popular.[1,2] People run for a variety of reasons ranging from a desire to stay active and healthy, or simply for enjoyment. The great part about running is that it does not require any substantial equipment, which means it is a very practical way to exercise and stay active. With the rise in the number of people who run regularly comes a rise in running related injuries. Runners of every age and skill level can suffer a running related injury. Because running and running related injuries are so prevalent, there is a lot of research being conducted on the topic.[1,2,3,4] Much of the literature is focused on determining risk factors for developing running related injuries or exercise related leg pain (ERLP) .[2,3,5,6,7,8] This means that these studies are quite broad, and although the research is helpful in identifying risk factors, there have been few follow-up studies that look at a single risk factor. There have been very few studies that look at mileage as it relates to injury, and those that do have been more specific to training for a particular event rather than just training in general.[3,4]

Figure 1:



PURPOSE

There are currently no studies that show the link between increasing mileage and injuries, especially as it relates to the transition from high school to collegiate cross country. Therefore, the purpose of this study is to determine if the increase in mileage results in a greater prevalence in injuries among collegiate cross country runners. Determining if a single risk factor, mileage, is a significant risk factor for injury has multiple implications. One implication is that the athletes could be better educated by coaches and athletic trainers about the proper way to increase mileage in order to reduce the likelihood for injury. A second implication is that if the mileage is found to be indicative of injuries, more focus could be placed on mileage as it relates to injuries instead of risk factors that have less researched evidence.

METHODS

Subjects

Participants for this study included cross country runners from colleges and universities in the NCAA Division II Great Midwest Athletic Conference (GMAC). This study received approval from the researcher's University's institutional review board. The survey was distributed to all 135 cross country runners in the GMAC, however, there were only 17 total responses (12.5%). The ratio of male to female participants can be viewed in figure 2 below. The survey was directly emailed to all cross country coaches in the GMAC who were instructed to forward the study to their runners. A reminder email was sent out 2 weeks after the initial survey was distributed. No vulnerable populations were included in this study. Participation was voluntary and anonymous and all results remained confidential.

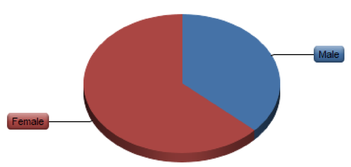
Data Collection

All participants who consented to this study completed an online survey through Qualtrics. A link to the survey was sent to the cross country coaches of GMAC schools who then distributed the survey to their athletes via email. If participants did not agree to the informed consent, they were not given the option to complete the survey. The survey consisted of questions regarding previous running experience, average weekly mileage during college and high school, and information about any previous and/or current running related injuries as well as demographic information. The survey was approximately 20 questions.

STATISTICAL ANALYSIS

All data was collected and stored online. Because this study had a mix of qualitative and quantitative questions, the data was analyzed in two ways. Quantitative data was analyzed using SPSS software (version 22.0 SPSS Inc, Chicago, IL). Questions that gathered qualitative data were reviewed to determine themes.

Figure 2:



RESULTS

A one-way ANOVA test revealed statistically significant differences between the number of years running and whether or not they participated in weight training during high school (p .003). The ANOVA also demonstrated a statistically significant difference between the number of years of running experience was compared to pertinent medical history that affects running (p .003). No other statistically significant results were demonstrated during the data analysis.

DISCUSSION

The purpose of this study was to determine if an increase in mileage was associated with a greater number of running related injuries in collegiate cross country runners. It was hypothesized that there would be a greater increase in injuries, especially in the freshmen year of college. No increase in injuries was seen at any particular level in this study. It is interesting to note that Reinking et al. reported shin splints as a common injury among distance runners, and this study found that tendinitis was the most commonly reported injury followed by shin splints and plantar fasciitis (Figure 1).[2,5] The average weekly mileage reported for the senior year of high school was 40 (SD of 14.34) compared to the average weekly mileage of freshman year which was reported as 47 miles per week (SD of 17.27). Although a slight increase in mileage was reported, there was no associated increase in injury prevalence. Many studies have reported gender as a risk factor for injuries, but gender was not found to be a risk factor in this study.[9,10,11,12] Running surface and shoe type were also not found to be risk factors for this study.

Limitations for this study included the fact that it was a self-reported study. Although the information received in this manner was beneficial because it was fast and easy for both the participant and the researcher, it would have been ideal if more information had been gathered through individual study including measurements of Q-angle, gait, shoe type, etc. Another limitation to this study was the sample size. Since there was a poor response rate, the sample may not be representative of the population as a whole. Relying on the coaches to distribute the surveys instead of contacting each runner individually was an additional limiting factor because it is not known whether or not every athlete received the survey.

CONCLUSION

Although there are many known risk factors for running related injuries, there have been no known studies published on the effects of increasing mileage as it relates to running injuries in the collegiate population. The goal of this study was to add to the pool of research on this topic and to provide applicable and relevant results. Because of the popularity of both competitive and recreational distance running it is important to stay up to date with research that identifies risk factors for running related injuries as well as preventative strategies.

Survey

What is your age? ___

What is your gender? Male Female

What year are you in college? Freshmen Sophomore Junior Senior

How many years have you been competitively running cross country (including both college and High school)? 1 2 3 4 5 6 7 8

What was your average weekly mileage in high school?
Freshmen year:
>10 10-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60+ N/A
I don't know
Sophomore year:
>10 10-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60+ N/A
I don't know
Junior year:
>10 10-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60+ N/A
I don't know
Senior year:
>10 10-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60+ N/A
I don't know

What is your average weekly mileage in college?
Freshmen year:
>10 10-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60+ N/A
I don't know
Sophomore year:
>10 10-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60+ N/A I don't know
Junior year:
>10 10-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60+ N/A I don't know
Senior year:
>10 10-20 20-25 25-30 30-35 35-40 40-45 45-50 50-55 55-60 60+ N/A I don't know

Did you do any weight training in high school? Yes No
If yes, was it required? Yes No
Please describe what kind of weight training you did in high school:
_____

Have you done any weight training in college? Yes No
If yes, was it required? Yes No
Please describe what kind of weight training you have done in college:
_____

Have you ever sustained a lower extremity injury that was related to running? Yes No

When did this occur? High School College N/A

What year? Freshmen Sophomore Junior Senior N/A

What was your injury?
-Tendinitis -Shin splints -Plantar fasciitis -stress fracture -sprain -strain -fracture -other -N/A
Please explain the injury in further detail:_____

Since being in college, have you sustained any subsequent lower extremity injuries related to running? Yes No

What was your injury/injuries? - check all that apply
-Tendinitis -Shin splints -Plantar fasciitis -stress fracture -sprain -strain -fracture -other -N/A
Please explain the injuries:_____

Did you have a cross country coach in high school? Yes No
What was the typical running surface you trained on in high school? - check all that apply
-grass -cement -track (indoor) -track (outdoor)
-asphalt -treadmill -other:_____

What is the typical running surface you train on in college? - check all that apply
-grass -cement -track (indoor) -track (outdoor)
-asphalt -treadmill -other:_____

Do you have any pertinent medical history that has affected or could affect your running? Yes No
If so, please explain:
_____

Did you switch shoe brands/models when you moved from high school to college? Yes No