



Original article

# Barefoot running survey: Evidence from the field

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## Abstract

**Background:** Running is becoming an increasingly popular activity among Americans with over 50 million participants. Running shoe research and technology has continued to advance with no decrease in overall running injury rates. A growing group of runners are making the choice to try the minimal or barefoot running styles of the pre-modern running shoe era. There is some evidence of decreased forces and torques on the lower extremities with barefoot running, but no clear data regarding how this corresponds with injuries. The purpose of this survey study was to examine factors related to performance and injury in runners who have tried barefoot running.

**Methods:** The University of Virginia Center for Endurance Sport created a 10-question survey regarding barefoot running that was posted on a variety of running blogs and Facebook pages. Percentages were calculated for each question across all surveys. Five hundred and nine participants responded with over 93% of them incorporating some type of barefoot running into their weekly mileage.

**Results:** A majority of the participants (53%) viewed barefoot running as a training tool to improve specific aspects of their running. However, close to half (46%) viewed barefoot training as a viable alternative to shoes for logging their miles. A large portion of runners initially tried barefoot running due to the promise of improved efficiency (60%), an attempt to get past injury (53%) and/or the recent media hype around the practice (52%). A large majority (68%) of runners participating in the study experienced no new injuries after starting barefoot running. In fact, most respondents (69%) actually had their previous injuries go away after starting barefoot running. Runners responded that their previous knee (46%), foot (19%), ankle (17%), hip (14%), and low back (14%) injuries all proceeded to improve after starting barefoot running.

**Conclusion:** Prior studies have found that barefoot running often changes biomechanics compared to shod running with a hypothesized relationship of decreased injuries. This paper reports the result of a survey of 509 runners. The results suggest that a large percentage of this sample of runners experienced benefits or no serious harm from transitioning to barefoot or minimal shoe running.

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**Keywords:** Barefoot; Biomechanics; Injuries; Running; Survey

## 1. Introduction

Running is becoming an increasingly popular activity among Americans with over 50 million participants. This

represents a growth of almost 8% in 1 year and a 57% increase in the last 10 years.<sup>1</sup> More people are running either for fitness or performance with almost 14 million US road race participants in 2011, a 7% increase from the year prior. All these runners are creating a huge market for running gear as running shoe sales topped 2.46 billion dollars in 2011 with over 65% of runners spending more than 90 dollars on their running shoes.<sup>1</sup> Running shoes have become increasingly more expensive with more technology and research behind the design of modern running shoes. However, running injuries appear to be just as prevalent as they always have been with an estimated 30%–75% of average recreational runners becoming injured at least once each year.<sup>2,3</sup> Despite increasing

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money and technology invested into shoe design, there has yet to be a decrease in running injury rates per capita.<sup>2</sup>

Humans have run minimally shod or barefoot for millions of years, but only recently has the running shoe become an essential part of a runner's gear.<sup>4</sup> Furthermore, there is little evidence to support the current practice of prescribing elevated running shoes with cushioned heels and pronation control systems to prevent injuries.<sup>5</sup> Currently, there is an increasing trend in the running community to revert back to the pre-modern shoe era with minimalist or barefoot running. This growing barefoot running movement has resulted in significant attention given in the national press.

With this recent focus, health care practitioners are inundated with questions regarding the safety and implementation of these programs. A cautious outlook on new trends, and an education heavily biased from the shoe industry itself, has made most clinicians reluctant to embrace alternative thinking regarding footwear needs. In fact, much resistance has been made by the clinical community with case studies that document the occasional injury. These injuries have likely been related to improper transitioning when loads on the body are increased faster than their rate of repair. Although multiple studies have shown decreased lower extremity joint torques and peak impact forces with barefoot running as compared to shod running,<sup>6–8</sup> there are no data on barefoot or minimal footwear running injuries. Therefore, the purpose of this survey study was to provide outcome data regarding the effects of barefoot running on efficiency, performance, and injury.

## 2. Methods

The University of Virginia Center for Endurance Sport created a 10-question survey completed by 509 runners. This survey was approved by the University of Virginia Institutional Review Board. The authors developed the list of questions based on importance to runners. The authors inquired whether the runners had tried barefoot running, if it made a difference in their running, and whether they instituted as part of their normal training plan. If so, the authors then inquired whether barefoot running played a role in injury and performance. The specific questions posed to participants are provided in Results section as well as in Figs. 1–10. The survey was released through the University of Virginia Speed clinic, its blog, and its Facebook site. Additionally, several

other blogs advertised the study. To be included, runners had to have tried barefoot running and had enough experience with barefoot running to be able to successfully answer all 10 questions, regardless of whether they were still barefoot running. We did not want to restrict the survey to runners who had successfully transitioned, as we felt it might have biased the results.

## 3. Results

The study included 509 participants who had some experience with barefoot running. A large portion of runners initially tried barefoot running due to the promise of improved efficiency (60%), an attempt to get past injury (53%) and/or the recent media hype around the practice (52%) (Fig. 1). Only a small percentage of runners started barefoot running at the suggestion of a friend (13%), coach (8%), health care clinician (1%), personal trainer (1%), or running store (<1%). A majority (40%) had been running barefoot for greater than 1 year, with 23% of respondents between 6 months and 1 year, and 23% for 2–6 months. Only 6% of runners who partook in the survey had tried barefoot running for less than 1 month (Fig. 2). Over 94% of participants incorporated some type of barefoot running into their weekly mileage. The majority of respondents ran only a small portion of their running barefoot, with 34% running less than 10%; however, 16% of participants ran 100% of their running barefoot (Fig. 3). The respondents ran barefoot on a variety of surfaces including grass (60%), city streets (55%), sidewalks (55%), trail (42%), and treadmills (19%). Respondents were allowed to select multiple surfaces, leading to totals equaling greater than 100% (Fig. 4). A majority of the participants (53%) viewed barefoot running as a training tool to improve specific aspects of their running. However, close to half (47%) viewed barefoot training as a viable alternative to shoes for logging their miles (Fig. 5). Forty-two percent of respondents used minimalist shoes as part of their running shoe rotation, with 17% of respondents using them for 25%–75% of their runs, and 19% of the runners using them for less than 25% of their runs, 5% of respondents had plans to purchase a minimal shoe in the near future, and 17% did not use a minimal shoe in their training (Fig. 6).

A majority of runners (55%) who participated in the study found no or slight performance benefit secondary to barefoot

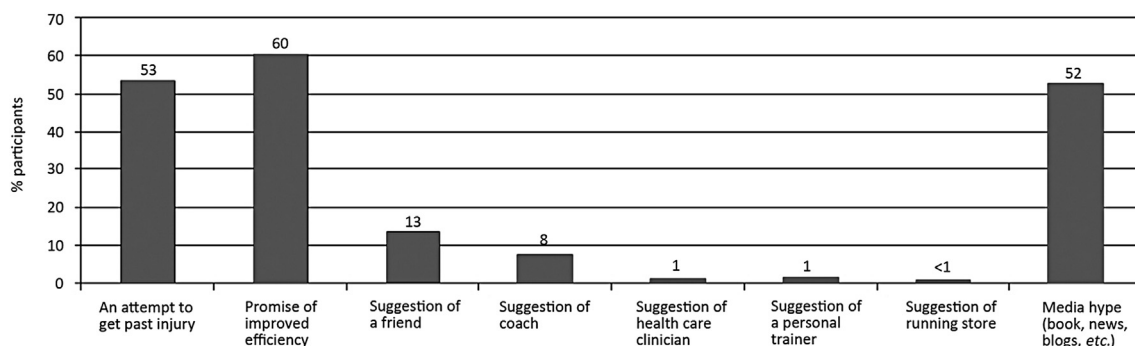


Fig. 1. Why did you begin barefoot running?

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