May 4th, 12:00 AM

Amenorrhea and Stress Fractures in Female New Jersey Division III Collegiate Runners: An Opportunity for Increased Health Education

Emily Forester
Rowan University

Tara Pellegrino
Rowan University

Amenorrhea and stress fractures in female New Jersey Division III collegiate runners: An opportunity for increased health education

ROWAN-VIRTUA School of Osteopathic Medicine

Emily Forester OMS-II, Tara Pellegrino DO

Background

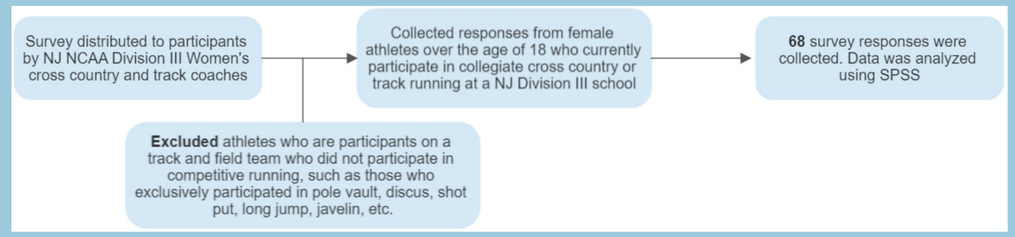
- Among the three National Collegiate Athletic Association (NCAA) divisions, Division II and Division III athletes show higher rates of bone stress injuries compared to Division I athletes.[1]
- Compared to other athletes, female athletes participating in repetitive-impact sport training are at a higher risk for bone stress injuries. The sports at the highest risk for bone stress injuries are Women's cross country, Women's track and Women's gymnastics.[1]
- In the NCAA, 9.1% of the injuries reported by Women's cross country athletes between 2014-2019 were fractures.[2]
- The Female Athlete Triad describes the impact of energy availability, menstrual function, and bone mass on female athletes. Dysfunction in any of these Triad categories leads to increased risk of bone stress injuries.[3]

Purpose:

This study aims to determine if there is an association between incidence of amenorrhea and subsequent occurrence of stress fractures among NJ NCAA Division III Women's cross country or track athletes. Understanding the presence of amenorrhea as a risk factor for stress fractures can help to guide interventions to aid in decreasing the high prevalence of stress fractures among collegiate female runners.

Methods

- IRB-approved, survey-based study distributed to NJ NCAA Division III Women's cross country or track athletes by email to coaches of the Division III cross country and track teams in NJ
- Survey data included information on participant menstrual history, stress fracture history, and athletic involvement (i.e. Year in school, Average weekly mileage, Short/middle/long distance involvement). Participants also indicated if their school's staff had ever educated them on the importance of menstrual regularity and athletics.



Results

- Of the 68 participants, 58.8% missed at least one menstrual cycle and 45.6% experienced at least one stress fracture during training or competition.
  - No missed menstrual cycles were due to pregnancy
- There is no significant difference between rate of stress fractures and age (p=0.971), academic year (p=0.537), or weekly mileage (p=0.462).
- There is a **significant** association between having missed at least one menstrual cycle during training or competition and the number of stress fractures experienced by NJ Division III female cross country and track athletes (p = 0.044).
- In regard to athletic staff communication on this topic, only 30.9% of respondents indicated that someone from their school's staff spoke to them about the importance of maintaining regular menstrual cycles during training. Responses varied based on the collegiate institution attended by the athlete (Figure 2)

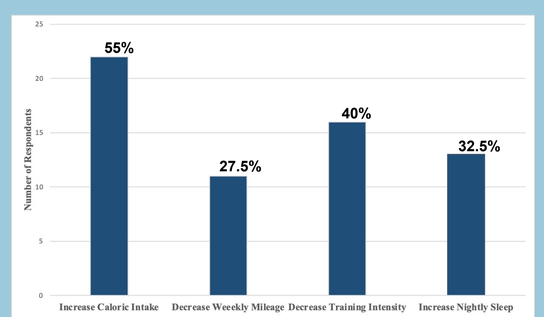


Figure 1. Self-reported changes in behavior that lead to restoration of menstrual cycle in individuals who had missed their menstrual cycle during training or competition

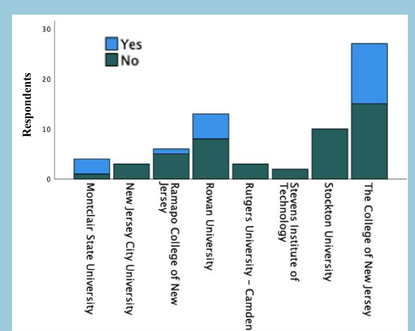


Figure 2. Self-reported rates of discussions with athletic staff about the importance of maintaining regular menstrual cycles during training based on collegiate institution

Conclusions

- Both amenorrhea and stress fractures are commonly seen among NJ NCAA Division III female cross country and track athletes
- Our data also highlights a need for increased education of NJ Division III female athletes regarding the importance of maintaining regular menstruation as a means of stress fracture prevention
  - We suggest the implementation of reproductive health education programs for NJ Division III female athletes and their coaches, which can help to highlight the importance of maintaining regular menstrual cycles as a means of stress fracture prevention.
- Limitations: sample size, low response rate, lack of participation from five of the 13 NJ NCAA Division III schools with a cross country or track and field team

Next steps:

1. Future investigation of the rates of amenorrhea and stress fractures among Division III female cross country and track athletes at large
2. Design health education programs for athletes and coaches

References

1. Bratsman A, Wassef A, Wassef CR, Jayaram P, Mosely JB, Shybut TB. Epidemiology of NCAA Bone Stress Injuries: A Comparison of Athletes in Divisions I, II, and III. Orthop J Sports Med. Jul 2021;9(7):23259671211014496. doi:10.1177/23259671211014496
2. Chandran A, Morris SN, Boltz AJ, Robison HJ, Collins CL. Epidemiology of Injuries in National Collegiate Athletic Association Women's Cross-Country: 2014-2015 Through 2018-2019. J Athl Train. Jul 1 2021;56(7):622-628. doi:10.4085/1062-6050-395-20
3. Barrack MT, Gibbs JC, De Souza MJ, et al. Higher incidence of bone stress injuries with increasing female athlete triad-related risk factors: a prospective multisite study of exercising girls and women. Am J Sports Med. Apr 2014;42(4):949-58. doi:10.1177/0363546513520295