



National Collegiate Athletic Association Student Athletes' Current and Prior Experiences with Weight Training Programs: A Comparison by Sex

Bridget A. McFadden¹, Harry P. Cintineo², Deon Eweka¹, Rosanny Carrera¹, Anoop T. Balachandran¹

¹ Department of Family, Nutrition, and Exercise Science, Queens College, CUNY, New York
² Lindenwood University, St. Charles, MO



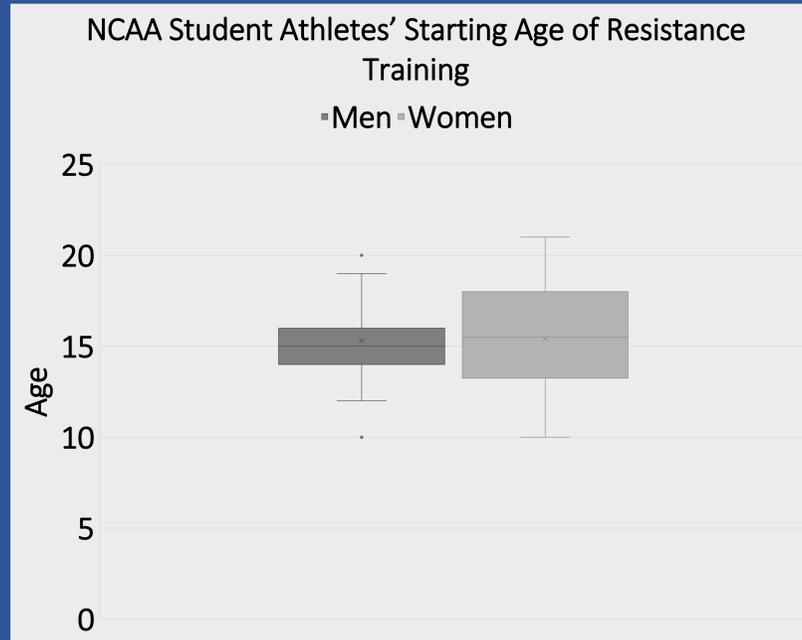
ABSTRACT

Adequate strength and conditioning programs for athletes prior to the start of a competitive season help build a fitness foundation and prepare players to compete at a high level. **PURPOSE:** The purpose was to compare men and women National Collegiate Athletic Association (NCAA) student athletes' current and previous experiences with weight training programs. Further, this study sought to explore the level of confidence men and women have developing and implementing their weight training programs. **METHODS:** Student-athletes competing in the NCAA at the Division I (D1), II (D2), or III (D3) levels were invited to participate in the anonymous, electronic survey via the online platform, Qualtrics. The survey consisted of 22 questions pertaining to demographics and sport participation, current weight training practices, previous experiences with weight training, and confidence levels related to weight training. Response frequencies were assessed for each question, and sample sizes used to determine frequencies were calculated from completed answers on a question-by-question basis. A Likert scale was used to assess confidence levels with responses including "very confident, confident, unsure, not really, and not at all". χ^2 analyses with Yates' continuity correction were performed to determine differences in frequencies between sexes with $\alpha = 0.05$.

RESULTS: 157 student athletes provided informed consent (52% women). Athletes that did not complete any questions were excluded from analysis (n=20). The sample included 31% D1; 54% D2; 14.5% D3 athletes. The average age athletes started competing in their respective sports were 8y/o for men and 7y/o for women. 92.6% of women and 80.9% of men reported current engagement in a weight training, of which 95% of women and 88% of men stated it was a sport requirement. No differences were found between sexes in regard to age of starting weight training (X_{men} & $X_{women}=15y$; $P>0.05$). No differences were found related to "confidence in ability to weight training on your own" ($P>0.05$). 46.6% of women and 52.6% of men described being "very confident". No differences were found related to "confidence in ability to design your own weight training program" ($P>0.05$). 15.5% of women and 24.6% of men indicated they were "very confident". When asked "were there any barriers to starting weight training prior to entering college?", responses frequently included access to equipment and gym facilities (11 responses), lack of confidence and anxiety in gym settings (8), and previous injury or fear of getting injured (4). Two individuals also mentioned avoiding "lifting before puberty" and not wanting to "stunt body development." **CONCLUSION:** No sex differences were apparent in weight training experience. Both sexes did express confidence in their ability to implement weight training programs. Barriers to entry were noted in relation to high school weight training programs. Addressing accessibility issues may aid increasing participation in youth athletes to coincide with age of sport participation. Further, educating student athletes on proper weight training implementation may bolster self-efficacy and foster lifelong healthy habits. **PRACTICAL APPLICATION:** Evaluating exposure rates to weight training across student athletes may help to inform coaches and trainers of appropriate load progression to optimize performance and reduce the risk of injury.

INTRODUCTION

- Differences in injury rates exist between men and women at the collegiate level
- Resistance training has been shown to improve not only performance, but injury risk factors as well
- Quantifying sex differences with regard to previous experience and exposure to resistance training may contribute to further understanding mechanisms behind differences in injury risk
- The purpose of this study was to assess and compare men and women student athletes' current and previous experiences with resistance training and to explore the level of confidence both sexes have regarding RT program implementation



Average age athletes started competing in their respective sport:

- Women= 8 y/o & Men= 9.5 y/o

Average age of starting resistance training:

- Women = 15 y/o & Men= 15 y/o ($P>0.05$)

27.1% of women and 12.3% of men reported not engaging in resistance training programs in high school

METHODS

Participants:

- 137 NCAA student-athletes (men: n = 65; women: n = 72).
- Eligibility Criteria:
 - ≥ 18 years old
 - Participating in NCAA collegiate sport during the 2023 and 2024 academic year
 - Competing in NCAA Division I (D1), II (D2), or III (D3) levels
- This research was approved by the Queens College, City University of New York (CUNY) Institutional Review Board for the Protection of Human Subjects (IRB#2023-0571-QC)

Survey Design:

- The survey was developed by researchers at Queens College, CUNY and incorporated terminology adapted from questionnaires, including the Demographics and Exercise History Questionnaire and Impacts of COVID-19 on Collegiate Student-Athlete Training, Health, and Well-Being Survey
- Following eligibility assessments and informed consent, questions pertained to demographic information (n=4), sport participation information (n=3), current resistance training practices (n=7), previous experiences with resistance training (n=6), and a Likert scale was used to assess confidence levels (n=2)

Procedures:

- The survey was sent to eligible student-athletes via website link and QR code. Recruitment occurred by snowball sampling through word-of-mouth, e-mails sent to athletic departments, strength and conditioning coaches, and social media
- Researchers reached out to collegiate athletic departments, coaches, and student athletes who were subsequently asked to share the anonymous electronic survey with eligible student athletes.
- The survey took approximately 10 minutes to complete and was available from February 2024 to December 2024

Statistical Analysis:

- Response frequencies were assessed for each question, and sample sizes used to determine frequencies were calculated from completed answers on a question-by-question basis
- Pearson's χ^2 analyses were performed to determine differences in frequencies between sexes in regard to age of starting resistance training and confidence levels related to resistance training.
- An α level of 0.05 used to determine statistical significance

ACKNOWLEDGEMENTS

Support for this project was provided by a PSC-CUNY Award, jointly funded by The Professional Staff Congress and The City University of New York.

RESULTS

- No differences were found between women and men related to "confidence in ability to weight training on your own" ($P=0.54$; $\chi^2=2.15$)
- No differences were found related to "confidence in ability to design your own weight training program" ($P=0.11$; $\chi^2=7.41$)

Table 1. NCAA Student Athletes' Confidence in Their Ability to Use the Following Modalities to Resistance Train

	P -value	χ^2	Sex	Very Confident	Confident	Unsure	Not Really Confident	Not at all Confident
Resistance Bands	0.63	2.57	Women	59.6%	35.1%	3.5%	1.8%	0.0%
			Men	58.5%	32.1%	1.9%	5.7%	1.8%
Kettlebells	0.72	1.33	Women	51.7%	41.1%	5.4%	1.8%	0.0%
			Men	55.6%	37.0%	7.4%	0.0%	0.0%
Dumbbells	0.77	1.13	Women	70.2%	26.3%	3.5%	0.0%	0.0%
			Men	66.6%	27.8%	3.7%	1.8%	0.0%
Body Weight	0.71	2.12	Women	57.1%	33.9%	7.1%	1.8%	0.0%
			Men	57.4%	35.2%	5.6%	0.0%	1.8%
Free Weights (other)	0.07	7.11	Women	47.4%	40.4%	12.3%	0.0%	0.0%
			Men	63.6%	32.7%	1.8%	0.0%	1.8%
Barbells	0.24	4.18	Women	49.1%	40.4%	8.8%	1.8%	0.0%
			Men	66.0%	30.2%	3.8%	0.0%	0.0%
Machines	0.07	8.48	Women	33.9%	41.1%	17.9%	5.4%	1.8%
			Men	55.6%	35.2%	9.3%	0.0%	0.0%

Table 1. compares how confident male and female student athletes feel using different types of resistance training modalities. %'s were calculated based on response frequencies assessed for each question and total number of responses.

Reported Barriers to Starting Resistance Training:

- 22.7% of women and 2.2% of men reported a lack of access to equipment and gym facilities
- 13.6% women and 8.9% of men reported a lack of confidence and anxiety in gym settings or lack knowledge/understanding
- 9.0% of women indicated scheduling or time management conflicts
- 2.3% of women and 8.9% of men reported previous injury/illness or fear of getting injured
- 2.3% of women and 2.2% of men also mentioned avoiding "lifting before puberty" and the "body was not fully developed yet and did not want to stunt growth"
- 2.2% of men reported lack of discipline and 2.2% also stated that weight training was not necessary
- In total, 50.0% women and 73.3% of men stated they experienced no barriers to starting weight training prior to entering college

PRACTICAL APPLICATION

- This study highlights the ≥ 6 -year difference between when an athlete begins sport participation and when they begin resistance training programs
- Youth athletes who begin to specialize in sport at an early age may benefit from incorporating resistance training into their daily conditioning earlier on in their careers to enhance movement skills and reduce the risk of injuries
- Collegiate strength and conditioning professionals who design programs for student athletes need to consider the athlete's resistance training experience prior to entering college
- Careful consideration should be made during the training season to develop motor skill proficiency and promote confidence in one's own abilities
- Conditioning programs for athletes who are expected to train on their own in the off-season should focus on utilizing equipment and techniques that the athletes have access to along with what they are most confident in implementing on their own