

# The Relationship Between Resistance Exercise Participation and Anxiety in a Nationally Representative Sample



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## Rationale

- Anxiety symptoms are common in adults and can be highly debilitating.<sup>1,2</sup>
- Resistance exercise (RE) may have protective effects for anxiety symptoms, but the relationship between the two is unclear.<sup>3,4</sup>
- Purpose: To assess associations between meeting the US Physical Activity (USPA) guidelines for RE and frequency of RE with anxiety severity, and between lifetime anxiety disorder status and RE participation.**

## Key Findings

- Those who met USPA RE guidelines had **lower anxiety symptom severity** compared to those who did not meet the guidelines.
- Each additional RE session per week was associated with lower anxiety symptom severity.
- The odds of having a lifetime anxiety disorder diagnosis were **32% higher** in those who did not meet USPA RE guidelines compared to those who did meet the guidelines.

## Conclusions

- Meeting the RE guidelines may have **protective effects** against anxiety disorders.
- The associations between RE and anxiety severity are small in this nationally representative sample with relatively low anxiety symptom severity.
- There is a **relationship between RE and anxiety**, particularly **diagnosed disorders**, suggesting interventions in people with anxiety may prove fruitful.

## Methods



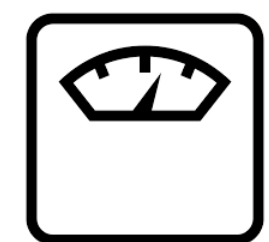
Secondary cross-sectional data was analyzed from the National Health Interview Survey 2022, a household interview survey designed for the noninstitutionalized population in the US by the Centers for Disease Control and Prevention, National Center for Health Statistics.<sup>3</sup>

### PARTICIPANTS

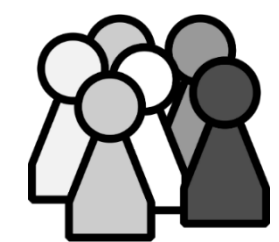
#### PARTICIPANT DEMOGRAPHICS (n=27,651)



**AGE (M±SD)**  
53.0 ± 18.4



**BMI (M±SD)**  
27.9 ± 5.5



**RACE (%)**  
White (78%)

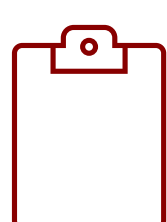


**SEX (%)**  
Female (54.4%)



Categorized as meeting U.S. Physical Activity (USPA) Guidelines for resistance exercise ( $\geq 2$ x/week; yes/no) and having a lifetime anxiety disorder (yes/no)

### MEASURES



Generalized Anxiety Disorder-7 (GAD-7) was used to quantify anxiety severity for Aims 1 and 2 with higher scores indicating greater severity (range: 0-21)

### ANALYSIS



Linear regression models (Aims 1 and 2)  
Logistic regression (Aim 3)  
All models included sex, age, and BMI as covariates

## Results

### Aim 1: Anxiety Symptom Severity for Adults Meeting or Not Meeting U.S. PA RE Guidelines

|                        | Mean ± SD GAD-7 Score |
|------------------------|-----------------------|
| Meeting Guidelines     | 1.92 ± 3.35           |
| Not Meeting Guidelines | 2.33 ± 3.98           |

Table 1. Values are mean + standard deviation. Abbreviations: PA = Physical Activity; RE = Resistance Exercise.

➤ Aim 1: On average, those who met USPA RE guidelines had a GAD-7 score 0.50 points lower compared to those who did not meet the guidelines ( $p < 0001$ ;  $d = 0.11$ ).

### Aim 3: Odds of having a lifetime anxiety disorder diagnosis based on meeting the USPA RE guidelines

| Variable                  | N     | Odds ratio        | p      |
|---------------------------|-------|-------------------|--------|
| Status                    |       |                   |        |
| Meeting RE Guidelines     | 7405  | Reference         |        |
| Not Meeting RE Guidelines | 16770 | 1.34 (1.23, 1.44) | <0.001 |

➤ The odds of having a lifetime anxiety disorder diagnosis were 34% higher in those who did not meet USPA RE guidelines compared to those who did meet the guidelines.

### Aim 2: Dose-Response Relationship Between Frequency of RE and Anxiety Symptom Severity

| Number of RE Days | Mean ± SD GAD-7 Score |
|-------------------|-----------------------|
| 0                 | 2.31 ± 3.99           |
| 1                 | 2.23 ± 3.54           |
| 2                 | 2.00 ± 3.38           |
| 3                 | 1.88 ± 3.28           |
| 4                 | 1.90 ± 3.17           |
| 5                 | 1.73 ± 3.11           |
| 6                 | 1.61 ± 2.66           |
| 7                 | 2.04 ± 3.76           |

Table 2. Values are mean + standard deviation. Abbreviations: RE = Resistance Exercise.

➤ On average, each additional RE session per week was associated with a .07 lower GAD-7 score ( $p < 0001$ ).

## Key References

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