Poster #62

The Role of Exercise Frequency in Enhancing the Effectiveness of Stress Coping Strategies in College Students

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BACKGROUND

- **Stress** among college students is considered a **public health crisis,** as students cope with academic, social, financial, and personal stressors.[1,2]
  - Chronic stress promotes poor academic and health outcomes among college students.
- Current literature supports **therapeutic effects of exercise** for both physical and psychological health.[3-5]
- **Cross-stressor adaptation hypothesis** proposes that regular exercise promotes adaptations in the stress response that buffer the effects of generic stressors;[6] however, the literature is filled with contradictory results concerning the effects of exercise on the physiological response to stress.[7-9]

RESEARCH QUESTIONS

1. Determine whether exercise frequency predicts psychological and physiological stress levels among college students
2. Elucidate the effect of exercise frequency on the efficacy of stress interventions unrelated to physical activity

METHODS

- Study participants: 25 college students in NSCI 419
- Physical activity was measured by frequency and intensity in Qualtrics survey on Day 1
- Perceived stress was measured by the Perceived Stress Questionnaire (PSQ)[10] in baseline and post-intervention Qualtrics surveys
- Stress intervention involved journaling about positive aspects of their day for 7 days
- Salivary cortisol samples were processed utilizing an ELISA kit

Level of Exercise	N	Gender (%)	Race (%)	Ethnicity (%)	Year in School (%)
High	16	7 Male (44) 8 Female (50) 1 Non-binary (6)	12 White (75) 4 Asian (25)	2 Hispanic (12) 14 Non-hispanic (88)	1 Junior (6) 15 Senior (94)
Medium	8	2 Male (25) 6 Female (75)	4 White (50) 4 Asian (50)	8 Non-hispanic (100)	1 Junior (13) 6 Senior (74) 1 Super-senior (13)
Low	1	1 Male (100)	1 Black or African American (100)	1 Hispanic (100)	1 Senior (100)

Table 1. Group demographics. Participants were grouped by self-reported exercise frequency, limiting demographic standardization. Percentages are reported in parentheses.

RESULTS

Does exercise frequency predict physiological and psychological stress prior to a stress intervention?

	Degrees of Freedom	F	Significance (p-value)
Between Groups	2	0.841	0.445

Table 2. One way ANOVA results comparing average baseline cortisol levels between each level of exercise. P>0.05 indicates nonsignificance.

	Degrees of Freedom	F	Significance (p-value)
Between Groups	2	0.674	0.520

Table 3. One way ANOVA results comparing average baseline PSQ scores between each level of exercise. P>0.05 indicates nonsignificance.

Does exercise frequency affect the effectiveness of a stress intervention?

Exercise Level	N	Mean	Std Deviation
High	16	0.0388	0.19996
Medium	8	-0.0124	0.21053
Low	1	-0.0890	

Table 4. Descriptive statistics of change in salivary cortisol for each level of exercise. Positive values for mean indicate a decrease in salivary cortisol (measured by competitive ELISA) after intervention.

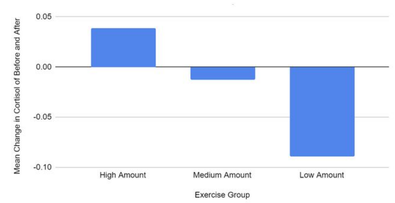

Fig 1. Comparison of average change in physiological stress between exercise groups. Positive values indicate a decrease in salivary cortisol (measured by competitive ELISA) after intervention.

	Degrees of Freedom	F	Significance (p-value)
Between Groups	2	0.311	0.736

Table 6. One way ANOVA results comparing average change in cortisol between exercise groups. P>0.05 indicates nonsignificance.

Exercise Level	N	Mean	Std Deviation
High	15	3.533	3.902
Medium	6	10.25	4.185

Table 5. Descriptive statistics of change in PSQ total score for each level of exercise. Positive values for change in total PSQ score indicate a decrease in psychological stress. Low exercise group excluded due to missing data for post survey.

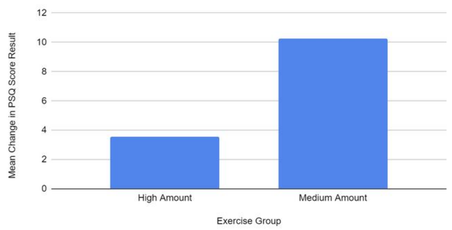

Fig 2. Comparison of mean change in PSQ for each level of exercise. Positive values for change in total PSQ score indicate a decrease in psychological stress. Low exercise group excluded due to missing data for post survey.

	Degrees of Freedom	F	Significance (p-value)
Between Groups	1	0.014	0.907

Table 7. Two tailed t-test results comparing average change in PSQ total score between each level of exercise. A t-test was done in place of an ANOVA due to availability of data for only 2 groups. P>0.05 indicates nonsignificance.

CONCLUSIONS

- We cannot identify conclusive effects of exercise level on physiological and psychological stress levels among college students
- We cannot affirm that exercise level moderates the outcome of alternate stress interventions

- Trends in data indicate improved intervention outcomes **on physiological stress** among college students engaging in greater amounts of exercise
- Trends in data indicate greater reduction in psychological stress among **moderately active students**, compared to highly active individuals

- Limited by a sample size of 25
  - Participant distribution greatly favored the high exercise group
  - 4 participants did not complete post intervention survey, including sole low exercise participant
  - Participants that had a negative pre or post cortisol value were adjusted to be 0

FUTURE DIRECTIONS

- Further research is required to elucidate the stress-buffering effects of physical exercise among college students
- Researchers should improve upon existing literature by monitoring stress levels **during high stress times** (ie exams) over a longer period
- Future studies should explore the effects of sex, race, and psychopathology on the relationship between exercise and stress to allow for efficacious stress interventions

REFERENCES AND ACKNOWLEDGMENTS

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