3-15-2012

Influence of Physical Activity on Stress Tolerance in College Students

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College years are one of the most stressful periods of a person’s life (Hales, 2009). Millennial college students are unique, including the manner in which they handle stressors. While physical activity plays a role in perceived stress level of college students, there is no need to examine physical activity in relation to the construct of stress tolerance. Variance in ability to handle stress can be attributed to stress tolerance (Welle & Graf, 2011). The purpose of this study was to identify types of physical activity (PA) significantly related to high stress tolerance among college students. An epidemiological cross-sectional study of randomly selected college students (N=973) completed the Stress Tolerance Questionnaire (STQ) comprised of checklists for stressors, coping strategies and physical activity. Stress tolerance ratios (STRs) were calculated, and subjects divided into high or low stress tolerance groups. Statistical differences were determined by Chi-Square and Odds Ratio (95%CI). Fourteen coping factors (out of 29) were significantly associated with high stress tolerance (HST); six were protective factors while the other eight put one at risk for low stress tolerance (p<0.05). Out of four types of PA studied, vigorous exercise, stretching, and resistance training were found to be significantly associated with HST (p<0.05); however, moderate exercise was not. Most coping mechanisms employed by college students are ineffective for alleviating stress and actually put these students at risk for low stress tolerance. In order for college student to guard against stress, physical activity needs to be promoted more within the college environment.

## Background

Nearly 60% of college students rated their stress levels as high or very high (Makrides et al., 1998). Previous research links high perceived stress levels with overall negative health of college students (Largo-Wright, Peterson, & Chen, 2005). Research suggests the coping strategy of physical activity to be an effective means of reducing stress and anxiety (Bhui, 2002).

While college students are relatively inactive and not meeting daily physical activity recommendations as reported by the 2010 American College Health Associations National College Health Assessment (ACHA-NCHA, 2010; Seo et al., 2007), participation in physical activity may support positive mental health of college students (Nguyen-Michel et al., 2006). While examining the influence that physical activity may have in relation to perceived stress level of college students, there is the need to examine physical activity in relation to the construct of stress tolerance (Welle & Graf, 2011; Bland, Melton, Welle, & Bigham, 2011; Izutsu et al., 2003).

## Purpose

The purpose of this study was twofold:

1. To determine what coping strategies were significantly associated with high stress tolerance, and
2. To objectively quantify the impact of different types of exercise on stress tolerance among college students.

## Methods

### Research Methodology

- Quantitative, analytical, cross-sectional design
- Probability, stratified random sample methodology
- Significant differences between Low and High Stress Tolerance groups by coping strategies and physical activity levels were assessed using Chi-Square analysis and Odds Ratio (95%CI).

### Instrumentation

- Stress Tolerance Questionnaire (STQ) is comprised of four checklists:
  - Daily hassle questionnaire (DHQ) (40 items),
  - Life events checklist (LEC) (30 items),
  - Stress symptoms inventory (42 items), and
  - Lifestyle/ coping mechanisms checklist (31 items).

### Data Analysis

- Stress tolerance ratios (STRs) were calculated and subjects were divided into high or low stress tolerance groups.
- Significant differences between Low and High Stress Tolerance groups by coping mechanisms and physical activity levels were assessed using Chi-Square analysis and Odds Ratio (95%CI).

## Results

- Out of the four different types of physical activity, vigorous exercise (p<0.01), stretching (p<0.05) and resistance training (p<0.001) were found to be significantly associated with high stress tolerance. Moderate exercise was not found to be associated with high stress tolerance. The finding that moderate physical activity did not equate to a higher stress tolerance is remarkable.

- Interestingly, four out of the six significant protective factors were activity based: exercised, engaged in leisure activity, engaged in extra-curricular sports. Encouraging students to get active and remain active can buffer students against the ill effects of stress. Students with high stress tolerance protect themselves by being active.

In order for college students to be able to effectively cope, physical activity needs to be promoted more within the college environment.

## Conclusion/Recommendations

Of the 31 coping mechanisms assessed, 14 were significant (p<0.05). Six of the 31 mechanisms were significant protective factors (p<0.05). Eleven factors placed a student at risk for low stress tolerance, of which eight were significant (p<0.05).

Out of the four different types of physical activity, vigorous exercise (p<0.01), stretching (p<0.05) and resistance training (p<0.001) were found to be significantly associated with high stress tolerance. Moderate exercise was not found to be associated with high stress tolerance. The finding that moderate physical activity did not equate to a higher stress tolerance is remarkable.