



2023 Technical Research Report

Overview

This report uses data sampled from 38 BIO Girls locations from January through May 2023. 414 participants completed preseason and postseason research surveys. Research surveys included measures assessing self-esteem (global, academic, body, family, and social) and mental health (anxiety symptoms).

Measures

This is the second year BIO Girls has used the following validated measures for self-esteem and mental health.

The 5-Scale Test of Self-Esteem for Children (Pope, McHale, & Craighead, 1988) was used to measure 5 types of self-esteem: global, academic, body, family, and social. Scores for each type of self-esteem were determined based on a scale of 0 (almost never), 1 (sometimes), 2 (almost always) for 10 items. The highest possible score for each type of self-esteem was 20, with all items being coded such that higher overall scores indicated higher levels of self-esteem. Total self-esteem was calculated by summing the scores of each type of self-esteem.

Global self-esteem refers to the evaluation of all parts of oneself. Sample questions included, “I am a good person” and “I like most things about myself.”

Academic self-esteem refers to the evaluation of oneself as a student, whether she meets her own standards for academic success. Sample items included, “I’m proud of the work I do at school” and “I think my report cards are good enough.”

Body self-esteem refers to the satisfaction with one’s physical appearance and capabilities. Sample items included, “I like the way I look” and “I am OK at the sports and games I like to play.”

Family self-esteem refers to the evaluation of oneself as a valued member of the family. Sample items included, “I am an important member of my family” and “My family is disappointed in me” (reverse-scored).

Social self-esteem refers to the feeling that one is a friend to others, no matter how “popular” she would be considered by others. Sample items included, “I am a good friend” and “I am lonely” (reverse-scored)



The GAD-7 (Spitzer, Kroenke, Williams, & Lowe, 2006) was used to measure mental health, specifically anxiety symptoms. Items assessed worrying, restlessness, irritability, fear, and nervousness. The GAD-7 has response options on a scale of 0 (not at all), 1 (several days), 2 (more than half the days), and 3 (nearly every day). Total GAD-7 scores can range from 0-21, with scores of 0-4 indicating minimal anxiety, 5-9 mild anxiety, 10-14 moderate anxiety, and scores greater than 15 indicating severe anxiety.

Statistical Analyses

Two-tailed t-test analyses with a significance level of $p < .05$ were used to determine whether changes in participants' self-esteem and mental health occurred from preseason to postseason. Separate tests were conducted for global self-esteem, academic self-esteem, body self-esteem, family self-esteem, social self-esteem, and anxiety symptoms.

Self-Esteem

Overall, participants experienced increases in all five types of self-esteem from preseason to postseason. Additionally, participants experienced a significant increase in total self-esteem.

	Preseason	Postseason	Significant Finding*
Type of Self-Esteem	Mean Score	Mean Score	T-value
Global	14.66	15.30	$t=3.23, p<.01^*$
Academic	15.61	16.11	$t=2.12, p=.03^*$
Body	15.41	16.12	$t=2.80, p=.01^*$
Family	16.97	17.16	$t=.88, p=.30$
Social	14.33	14.73	$t=1.16, p=.10$
Total	76.98	79.42	$t=2.53, p=.01^*$

Note. Effect sizes were small ($d=0.2$).

- 7 out of 10 participants experienced an increase in global self-esteem.
- 7 out of 10 participants experienced an increase in academic self-esteem.
- 7 out of 10 participants experienced an increase in body self-esteem.
- 6 out of 10 participants experienced an increase in family self-esteem.
- 6 out of 10 participants experienced an increase in social self-esteem.
- 7 out of 10 participants experienced an increase in total self-esteem.

Mental Health



Participants experienced decreases in anxiety symptoms from preseason (M=5.77) to postseason (M=5.37). Preseason and postseason mean scores indicate that participants, on average, experienced mild anxiety.

Preseason:

- 47% of participants experienced minimal anxiety.
- 29% of participants experienced mild anxiety.
- 19% of participants experienced moderate anxiety.
- 5% of participants experienced severe anxiety.

Postseason:

- 54% of participants experienced minimal anxiety.
- 27% of participants experienced mild anxiety.
- 12% of participants experienced moderate anxiety.
- 7% of participants experienced severe anxiety.

50% of participants experienced a decrease in anxiety symptoms.

During preseason, 24% of participants experienced “high anxiety” (categorized by moderate or severe anxiety scores on the GAD of 10+). Of those with high anxiety, 73% decreased in their overall anxiety scores by postseason. 19% of those with high anxiety decreased to minimal anxiety levels (GAD scores of 0-4).