



BIO Girls
2022 Technical Research Report
Youth Program

Overview

This report uses data from 20 BIO Girls locations serving 701 girls from January through May 2022. 547 participants completed preseason research surveys, and 483 participants completed postseason research surveys. Research surveys included measures assessing self-esteem (global, academic, body, family, and social) and mental health (anxiety symptoms).

Measures

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.

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. Additionally, follow-up t-tests were conducted to examine changes in self-esteem among participants in each of the school grades taking part in BIO Girls (grades 2-6).

Self-Esteem

Overall, participants experienced statistically significant increases in all five types of self-esteem from preseason to postseason.

	Preseason	Postseason	Significant Finding*
Type of Self-Esteem	<i>Mean Score</i>	<i>Mean Score</i>	<i>T-value</i>
Global	14.65	15.09	$t=2.24, p=.03^*$
Academic	15.42	15.99	$t=.2.50, p=.01^*$
Body	15.26	15.77	$t=2.07, p=.04^*$
Family	16.82	17.34	$t=2.57, p=.01^*$
Social	14.48	15.01	$t=2.26, p=.02^*$

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



Mental Health

Participants experienced decreases in anxiety symptoms from preseason (M=6.02) to postseason (M=5.61), although this decrease was not statistically significant. 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.
- 17% of participants experienced moderate anxiety.
- 7% of participants experienced severe anxiety.

Postseason:

- 55% of participants experienced minimal anxiety.
- 24% of participants experienced mild anxiety.
- 13% of participants experienced moderate anxiety.
- 8% of participants experienced severe anxiety.

Comparison by Grade

Mean scores for global, academic, body, family, and social self-esteem generally increased from preseason to postseason for participants in each grade. Additionally, anxiety symptoms generally decreased for participants in each grade. However, due to small sample sizes for each grade, most changes were not statistically significant. P-values less than or equal to .10 were considered marginally significant and noted below.

Global Self-Esteem

	Preseason	Postseason	Significant Finding
Grade	<i>Mean Score</i>	<i>Mean Score</i>	<i>T-value</i>
2 nd grade	14.93	15.01	t=.23
3 rd grade	14.62	15.08	t=1.18
4 th grade	14.80	14.78	t=-.05
5 th grade	14.66	15.47	t=1.91, p=.06
6 th grade	13.35	14.68	t=1.62, p=.10

Academic Self-Esteem

	Preseason	Postseason	Significant Finding
Grade	<i>Mean Score</i>	<i>Mean Score</i>	<i>T-value</i>
2 nd grade	15.59	16.14	t=1.37
3 rd grade	15.24	15.53	t=.54
4 th grade	15.74	16.42	t=1.40
5 th grade	15.75	16.02	t=.52
6 th grade	13.69	15.13	t=1.72, p=.09

Body Self-Esteem

	Preseason	Postseason	Significant Finding
Grade	<i>Mean Score</i>	<i>Mean Score</i>	<i>T-value</i>
2 nd grade	16.02	16.77	t=1.92, p=.05*
3 rd grade	15.74	15.60	t=-.27
4 th grade	15.16	15.26	t=.17
5 th grade	14.50	15.40	t=1.59, p=.10
6 th grade	13.32	14.72	t=1.44

Family Self-Esteem

	Preseason	Postseason	Significant Finding
Grade	<i>Mean Score</i>	<i>Mean Score</i>	<i>T-value</i>
2 nd grade	16.65	17.13	t=1.33
3 rd grade	16.86	17.56	t=1.78, p=.08
4 th grade	16.75	16.78	t=.05
5 th grade	17.33	18.03	t=1.69, p=.09
6 th grade	16.05	16.98	t=1.34



Social Self-Esteem

	Preseason	Postseason	Significant Finding
Grade	<i>Mean Score</i>	<i>Mean Score</i>	<i>T-value</i>
2 nd grade	13.96	14.34	t=.84
3 rd grade	14.40	14.62	t=.40
4 th grade	14.96	15.76	t=1.70, p=.09
5 th grade	15.13	15.45	t=.65
6 th grade	13.62	14.77	t=1.59, p=.10

Anxiety Symptoms

	Preseason	Postseason	Significant Finding
Grade	<i>Mean Score</i>	<i>Mean Score</i>	<i>T-value</i>
2 nd grade	5.80	5.31	t=-.83
3 rd grade	6.30	6.40	t=..19
4 th grade	5.81	4.94	t=-1.27
5 th grade	5.60	5.38	t=-.34
6 th grade	7.33	6.66	t=-.56