



BIO Girls 2021 Outcome Based Research

Research Team

BIO Girls partnered with the following researchers to conduct this study:
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Methodology

In 2021, BIO Girls served a total of 1,403 girls in grades 2-6. The girls received a 12-session, 90-minute weekly program, including lessons on the four pillars of mental wellness, healthy relationships, leadership, and kindness. Before the program started, a sample of girls were asked to complete a set of surveys using Qualtrics, a secure online data collection tool. Additionally, at the end of the program, they were asked to complete the same set of surveys. Data was collected from girls using Samsung Galaxies.

Girls were asked to complete three surveys on self-esteem, body esteem, and enjoyment of physical activity. The surveys used to measure these constructs were widely-used, well-established tools that have shown evidence of reliability and validity in past research studies. First, the 10-item Self Esteem subscale of the Behavior Assessment System for Children (Reynolds et al., 2004) was used to measure girls' self-esteem, with a response rating scale from 0 (never) to 3 (almost always) or false (0) to true (2). Second, the 20-item Body Esteem Scale (Mendelson & White, 1993), which includes three subscales for appearance, weight, and attributions, was used to measure body esteem, with a response rating scale including 0 (no), 1 (sometimes), and 2 (yes). Lastly, the 16-item Physical Activity Enjoyment Scale (Murrock et al., 2016) was used to measure girls' enjoyment with physical activity, with a response rating scale from 1 (disagree a lot) to 5 (agree a lot).

Statistical Analyses and Results

In order to analyze changes in self-esteem, body esteem, and enjoyment of physical activity among girls from pre- to post-test, t-tests were conducted. Results from these analyses showed that, by the end of the BIO Girls program, girls scored higher on self-esteem, body esteem, and enjoyment of physical activity. Below, mean scores for each measure are reported to show differences in girls' reports from pre- to post-test.

<u>Scale</u>	<u>Pre-test</u>	<u>Post-test</u>
Self-esteem	40.29	41.21
Body esteem	31.30	33.30
Enjoyment of physical activity	59.51	61.41

Self-Esteem

Particularly, as noted in the above table, girls scored significantly higher on overall measures of self-esteem ($t=-1.62$, $p=.00$) and body esteem ($t=-1.92$, $p=.08$) from pre-test to post-test. Additionally, girls scored significantly higher on the appearance esteem subscale at post-test ($M= 22.12$) than at pre-test ($M=20.66$; $t=-2.11$, $p=.02$). P-values provide evidence of statistically significant findings. Typically, a p-value of less than .05 indicates statistically significant findings; due to a relatively small sample size, a p-value of .10 was also considered statistically significant.

Data from previous years of BIO Girls has shown that girls experienced increases in self-esteem. In order to more fully explore how girls' self-esteem changed in 2021, analyses of individual items on the Self Esteem subscale of the Behavior Assessment System for Children were conducted. To conduct these analyses, t-tests (for mean score data) and chi square tests (for frequency data) were used.

Analyses revealed the following statistically significant findings:

- Significantly more girls reported feeling good about themselves ($\chi^2=2.82$ $p=.09$)
- Significantly fewer girls reported wishing they were different ($\chi^2=4.32$ $p=.04$)
- Girls scored significantly lower on getting upset about their looks ($t=1.30$, $p=.08$)
- Girls scored significantly lower on their looks bothering them ($t=1.27$, $p=.06$)
- Girls scored significantly higher on liking their looks ($t=-1.31$, $p=.01$)

Additionally, although not statistically significant, it is important to mention that the number of girls reporting that they wished they were someone else decreased from pre-test to post-test. Below, item scores and percent ages are reported to show differences in girls' reports from pre- to post-test.

Item	Pre-test	Post-test
I feel good about myself	95%	99%
I wish I were different	17%	8%
I wish I were someone else	11%	6%
I get upset about my looks	.67	.57
My looks bother me	.46	.37
I like the way I look	2.29	2.42

Body Esteem

Further, to more fully explore how girls' body esteem, or specific feelings about their body, changed in 2021, analyses of individual items on the Body Esteem Scale were conducted. Again, t-tests comparing mean scores were used.

Analyses revealed the following statistically significant findings of particular interest:

- Girls scored significantly higher on their weight making them happy ($t=-1.67$, $p=.01$)
- Girls scored significantly higher on liking what they saw in the mirror ($t=-2.13$, $p=.00$)
- Girls scored significantly higher on being proud of their bodies ($t=-2.68$, $p=.00$)
- Girls scored significantly higher on thinking they have a good body ($t=-1.15$, $p=.03$)
- Girls scored significantly lower on wanting to change their looks ($t=1.42$, $p=.00$)

- Girls scored significantly lower on feeling ashamed of their looks ($t=1.26, p=.01$)

Below, select item scores are reported to show differences in girls' reports from pre- to post-test.

<u>Item</u>	<u>Pre-test</u>	<u>Post-test</u>
My weight makes me happy	1.40	1.55
I like what I see when I look in the mirror	1.56	1.70
I'm proud of my body	1.67	1.84
I think I have a good body	1.70	1.78
There are lots of things I'd change about my looks if I could	.58	.45
I often feel ashamed of how I look	.36	.27

Enjoyment of Physical Activity

Lastly, t-test analyses on individual items of the Physical Activity Enjoyment Scale were conducted to examine girls' mean score changes in feelings about physical activity.

Analyses revealed the following statistically significant findings of particular interest:

- Girls were more likely to report enjoying physical activity ($t=-1.76, p=.08$)
- Girls were less likely to report disliking physical activity ($t=1.70, p=.09$)
- Girls were less likely to report feeling bored with physical activity ($t=2.54, p=.01$)
- Girls were less likely to report wanting to do something else other than physical activity ($t=1.71, p=.09$)

Below, select item scores are reported to show differences in girls' reports from pre- to post-test.

<u>Item</u>	<u>Pre-test</u>	<u>Post-test</u>
I enjoy physical activity	4.35	4.55
I dislike physical activity	4.36	4.11
I feel bored with physical activity	4.12	3.72
I feel as though I'd rather be doing something else	4.07	3.78