

# **Statistical Analysis of the Survey Results For Girls on the Run**

**Western North Carolina Region**

**Fall 2007**

## **Abstract**

The following document is an analysis of participating girls' responses to surveys taken before and after the fall 2007 Girls on the Run program. Questions were grouped by topic (self worth or attitudes toward physical exercise) and wording style (questions stated in negative terms or positive terms). The results from both positive and negative worded questions show statistically significant improvements in self-worth, while the attitudes towards physical exercise only showed improvements when worded negatively. In addition, girls were asked to circle a body type they perceived as being like theirs, and circle one that they preferred to look like. Prior to the program 38% of the girls indicated that their physical perception of self was what they wanted to look like, while after the program that number increased to 57%, a statistical significant improvement.

## **Acknowledgements**

This report was written for Girls on the Run by Lothar A. Dohse, who wishes to thank his Statistics Students for their help in entering and analyzing the data. He also wishes to thank UNCA for allowing the use of their facilities and computer resources.

# Girls on the Run, Fall 2007

## Statistical Summary of Surveys

Participating WNC sites	Participants	Valid Surveys completed	
		Pre-test	Post-test
Asheville Middle	17	16	9
Claxton	10	10	
Candler	25	24	15
Erwin Middle	18	18	13
Fairview	20	19	14
FDNSL	18	17	11
Francine Delaney	27	25	20
Glen Arden A	25	25	22
Glen Arden B	21	21	19
Glen Arden C	18	18	16
Haw Creek	26	19	16
Haywood	7	7	
HCA	13	12	10
Hominy Valley	23	21	16
Issac Dickson	21		20
Jackson	9	9	7
Johnston	20	19	17
Jones	8	8	5
Leicester	9	7	6
N Canton	10		9
Oakley	16	15	13
Old Fort A	19	19	18
Old Fort B	19	19	18
Reynolds	10	10	
Swain	14	13	12
Valley Springs	21	20	16
WBES	7	7	
Weaverville	10	10	
<b>Total</b>	<b>461</b>	<b>408</b>	<b>322</b>

## Demographics

### Participants broken down by race

<b>Ethnic Background</b>	<b>Frequency</b>	<b>Percent</b>
European American	316	84%
African American	29	8%
Latin American	18	5%
Asian American	7	2%
Other	3	1%
(No information)	(85)	
Total	461	100%

Information taken from registration form

### Grade of Participant

<b>School Grade</b>	<b>Frequency</b>	<b>Percent</b>
Third	101	29%
Fourth	81	23%
Fifth	100	28%
Sixth	27	8%
Seventh	25	7%
Eighth	17	5%
Total	351	100%

Information taken from pre & post test surveys

### Number of Times Participant joined GOTR

<b>Number of times with GOTR</b>	<b>Frequency</b>	<b>Percent</b>
First timer	303	84%
Second timer	47	13%
Third timer	8	2%
Four or more times	4	1%
Total	362	100%

Information taken from pre & post test surveys

## Comparative Analysis of Pre and Post-Test Surveys

### **Methodology**

In order to analyze the survey results more carefully indices were created to measure self-worth and attitude toward physical activity. The responses NO!!, NO, YES, and YES!! were assigned numerical values ranging from -3 to +3. For statements posed in a positive way (Example "I am satisfied with myself.") NO!! = -3, NO = -1, YES = +1 and YES!! = +3. If a respondent marked between the two middle choices, or they skipped that particular item but answered all the others a value of "0" was assigned as a response. For statements posed in the negative (Example, "I feel that I am a failure.") the signs of the numeric responses were reversed. Thus NO!! has value +3.

For each index the numeric responses of 5 questions were added. These indices each ranged from -15 to 15, with 0 being a neutral response. A negative value indicated that the respondent felt negatively toward either self or physical activity.

### **Analysis of Self-Worth**

The survey has 10 items that address a girl's feeling toward self. Five of those were framed in a positive way. These were:

- I am satisfied with myself.
- I feel that there are a lot of good things about me.
- I can do things as well as most other people.
- I have a lot to offer to people.
- I take a positive attitude toward myself.

The combined numeric score formed the first index.

The second index was created using the negative statements about self. These were:

- I don't think I am good at all.
- I feel I don't have much to be proud of.
- I feel useless at times.
- I wish I could have more respect for myself.
- I feel that I am a failure.

### **Summary of Results**

Both indices showed significant improvement in the post test. The index based on positive statements moved from average value of 6.9 to 8.5, while the index based on negative statements should an even larger improvement. Its average jumped from 5.9 to 8.0. (See tabulate results.)

It should be noted that most girls felt very positive toward themselves but of those that didn't the indices also showed a significant improvement in the before and after tests. According to the first index 7% of the girls had a negative attitude toward self in the pre-test and that number dropped to 2%, while in the second index the percentage dropped from 19% to 8%.

There were a number of girls that dropped from the program and a number of sites that did not do a post test. However, there was no evidence to indicate that girls who had negative attitude toward self were more likely to drop from the program.

**Results of Self-worth Comparative Analyses: Index A (Positively worded statements.)**

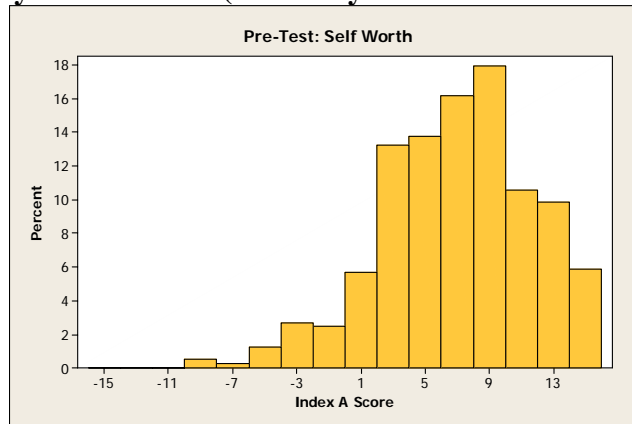
**T-test**

**Statistical summary of scores**

	Pre-test	Post-test
N (1)	408	339
<b>Average</b>	<b>6.93</b>	<b>8.52</b>
Std. Dev.	4.73	4.28
t-test = 4.88 (p-value<0.001)		

**Conclusion:**

**Scores significantly improved (2)**



**Chi-square test**

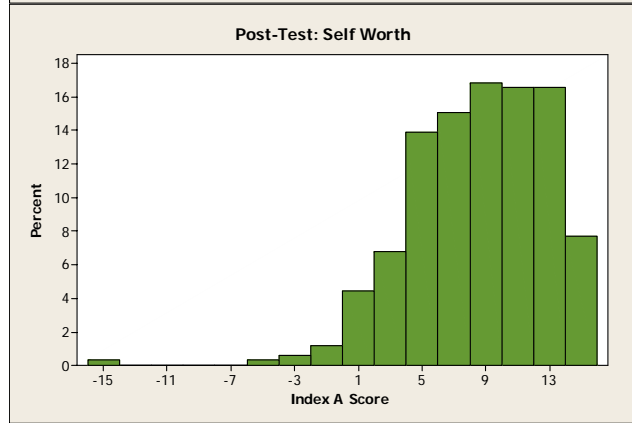
**Girls with negative self-worth**

	Pre-test	Post-test
Score ≤ 0	29	8
Chi-sq = 8.9 (p-value=0.003)		

**Conclusion:**

**Numbers had significant drop(2)**

- (1) Number taking survey
- (2) Improvement is shown not to be due to chance.



**Results of Self-worth Comparative Analyses: Index B (Negatively worded statements.)**

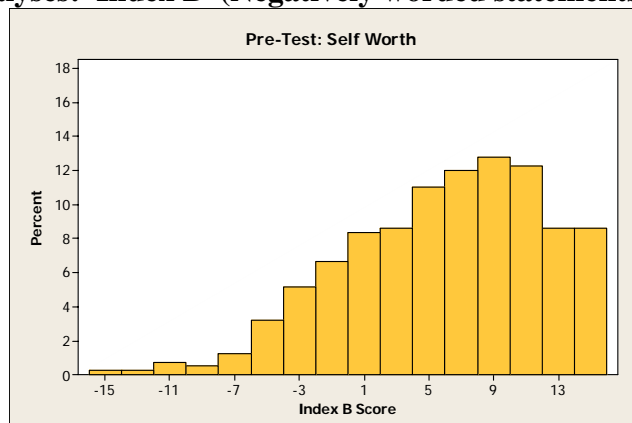
**T-test**

**Statistical summary of scores**

	Pre-test	Post-test
N	408	339
<b>Average</b>	<b>5.93</b>	<b>8.01</b>
Std. Dev.	6.10	5.19
t-test = 5.03 (p-value<0.001)		

**Conclusion:**

**Scores significantly improved**



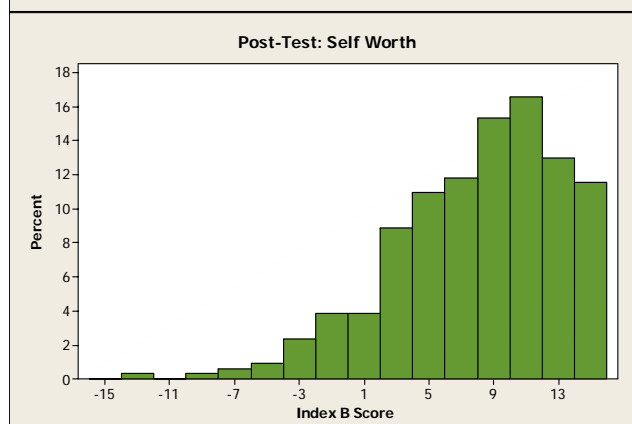
**Chi-square test**

**Girls with negative self-worth**

	Pre-test	Post-test
Score ≤ 0	76	26
Chi-sq = 18.6 (p-value<0.001)		

**Conclusion:**

**Numbers had significant drop**



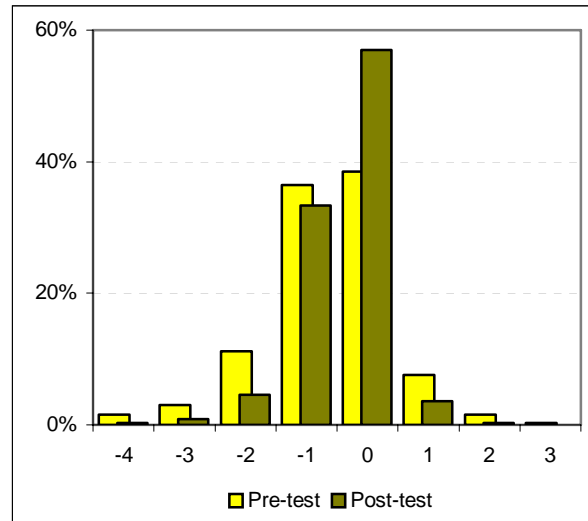
## Analysis of Girl's self-view of body shape

Girls were asked to circle the body shape that they perceive themselves as having and were asked to also circle the body shape that they wanted to have. The following is the result of the difference of the two shapes. Negative numbers indicate that their preferred shape is less than their perceived shape (i.e. the girl wishes to be thinner.) The post test results show a significant larger number of girls were satisfied with the way their bodies looked.

**Item: Difference between what a girl thought and what she wanted to look like.**

### Response Frequencies

Diff.	Pre-test		Post-test	
-4	6	1½%	1	0%
-3	12	3%	3	1%
-2	44	11%	15	5%
-1	144	36%	110	33%
0	152	38%	188	57%
1	30	8%	12	4%
2	6	1½%	1	0%
3	1	0%		
<b>Total</b>	<b>395</b>	<b>100%</b>	<b>330</b>	<b>100%</b>
(Chi-sq test = 37.5) p-value < 0.001				
<b>Significant improvement</b>				



## Analysis of Attitude towards Physical Activity

The survey has 12 items that address a girl's feeling towards being physically active and exercising. Here too, some questions were framed in a positive way and some on a negative. For consistency five positive questions were chosen to be included in the index. These were:

- I look forward to physical activity.
- Physical activity is important to me.
- Physical activity feels good.
- I would change my schedule to participate in physical activity.
- Physical is the best part of my day.

The second index uses the responses to these negative statements about physically activity:

- I wish there were better ways to get healthy than being physical active.
- I do not enjoy physical activity.
- I don't like thinking about physical activity.
- I have to force myself to be physical active.
- I do not like being physical active every day.

## Summary of Results

These indices showed mixed results. The difference between the pre- and post-test average scores of the first index was negligible. The responses were very similar. However, the situation was different when the statements were phrased negatively. The second index had a significant increase in average scores going from 6.8 to 8.0. Thus it is possible to conclude that less negative attitude towards physical activity after the program than before. However, the inquiry on amount of times girls exercised showed no change.

**Attitudes towards Physical Activity: Index A (Positively worded statements.)**

**T-test**

**Statistical summary of scores**

	Pre-test	Post-test
N	400	334
<b>Average</b>	<b>8.66</b>	<b>8.90</b>
Std. Dev.	5.03	5.11

t-test = 0.64 (p-value=0.53)

**Conclusion:**  
**No statistical difference**

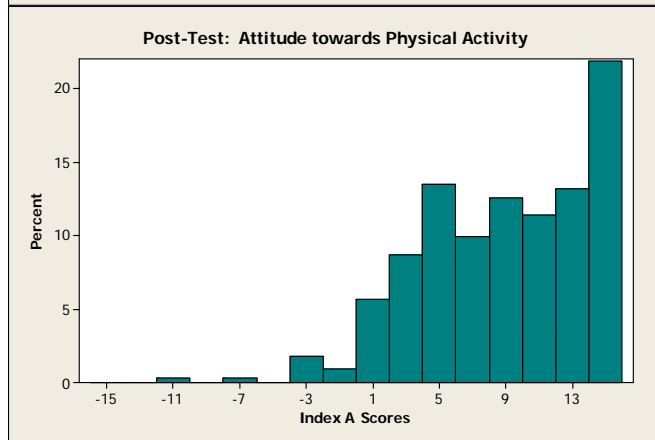
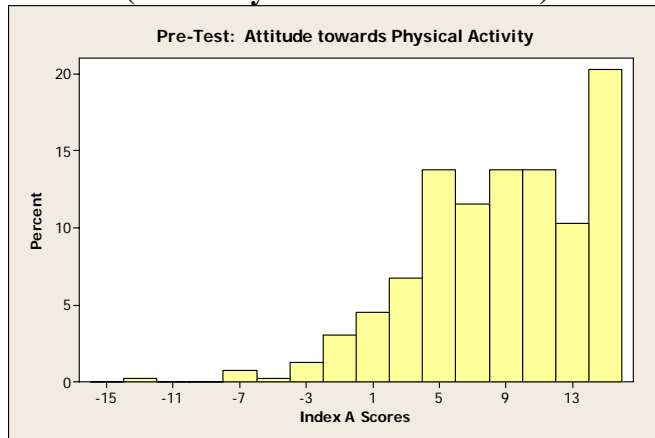
**Chi-square test**

**Girls with negative attitude toward Physical Activity**

	Pre-test	Post-test
Score ≤ 0	23	11

Chi-sq = 2.5 (p-value=0.12)

**Conclusion:**  
**No significant change**



**Attitudes towards Physical Activity: Index B (Negatively worded statements.)**

**T-test**

**Statistical summary of scores**

	Pre-test	Post-test
N	400	334
<b>Average</b>	<b>6.81</b>	<b>8.03</b>
Std. Dev.	6.14	5.45

t-test = 2.84 (p-value<0.005)

**Conclusion:**  
**Scores significantly improved**

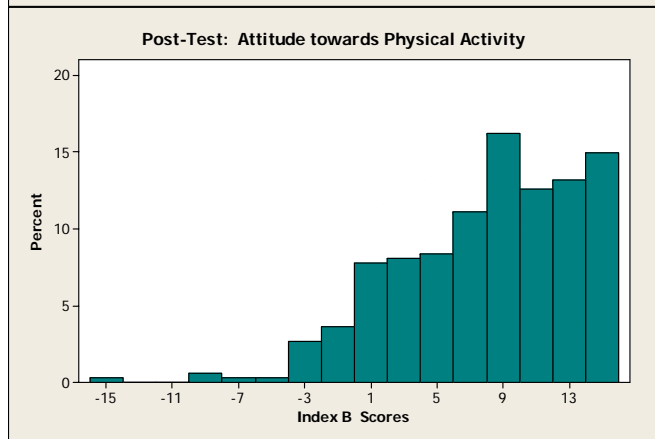
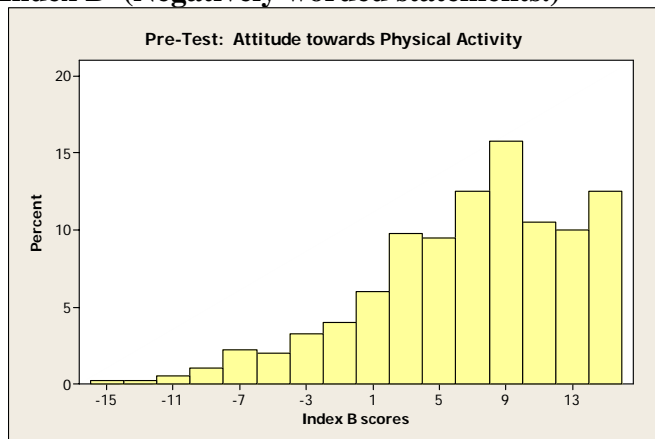
**Chi-square test**

**Girls with negative Attitude towards Physical Activity**

	Pre-test	Post-test
Score ≤ 0	56	29

Chi-sq = 5.03 (p-value<0.025)

**Conclusion:**  
**Numbers had measurable drop**



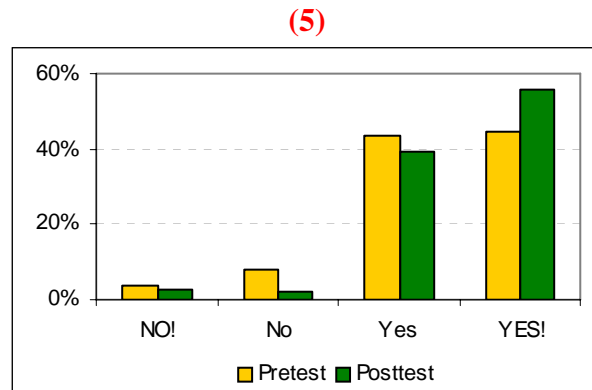
## Responses to Individual Statements Survey

### Items with regards to self esteem

**(1) Item: I am satisfied with myself (with explanation)**

**Response Frequencies**

(2) Responses	Pre-test	Post-test
NO!	16	9
No	32	8
Yes	176	134
YES!	179	189
<b>Total</b>	<b>403</b>	<b>340</b>
<b>(3) p-value &lt; 0.001</b>		
<b>(4) Very significant improvement!</b>		

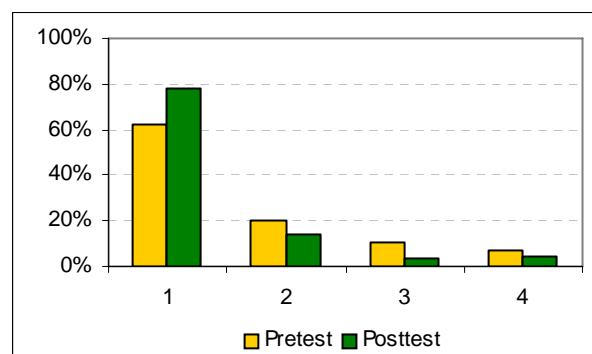


- (1) Question on the survey.
- (2) Possible choices as answers to questions. Questions left blank were not counted.
- (3) P-value (based on the Chi-square statistic) gives the probability that the observed improvement was due to chance.
- (4) Significance level is based on the p-value. Significant improvement was shown if the p-value was less than 1%. If the p-value was less than 0.1% the improvement in attitudes was considered very certain.
- (5) This is the relative frequency graph that contrasts the pre and post test.

**Item: I do not think I am good at all**

**Response Frequencies**

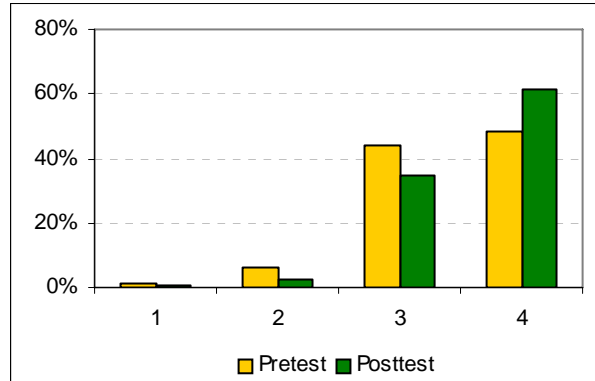
Responses	Pre-test	Post-test
NO!	254	262
No	80	47
Yes	44	11
YES!	27	16
<b>Total</b>	<b>405</b>	<b>336</b>
<b>p-value &lt; 0.001</b>		
<b>Very significant improvement!</b>		



**Item: I feel that are a lot of good things about me**

**Response Frequencies**

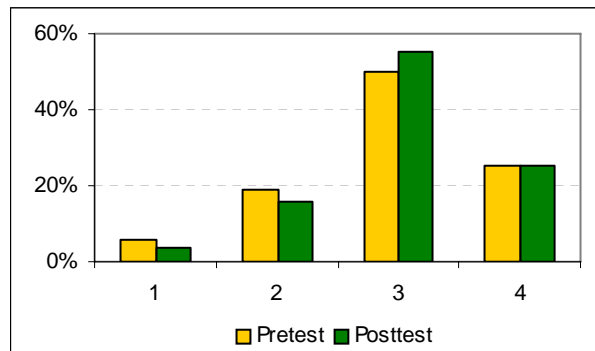
Responses	Pre-test	Post-test
NO!	5	3
No	24	9
Yes	179	118
YES!	197	207
Total	405	337
p-value = 0.003		
<b>Significant improvement</b>		



**Item: I can do things as well as most other people**

**Response Frequencies**

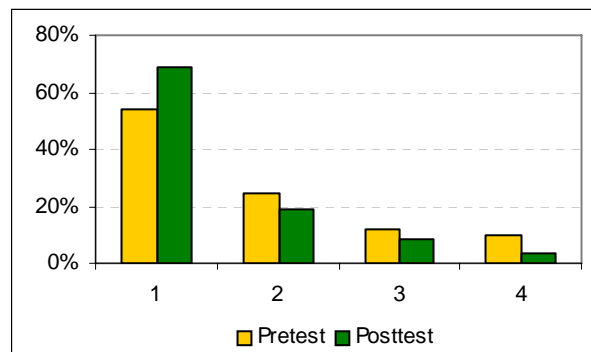
Responses	Pre-test	Post-test
NO!	23	13
No	76	53
Yes	202	188
YES!	101	85
Total	402	339
p-value = 0.33		
<b>No significant change</b>		



**Item: I feel I do not have much to be proud of**

**Response Frequencies**

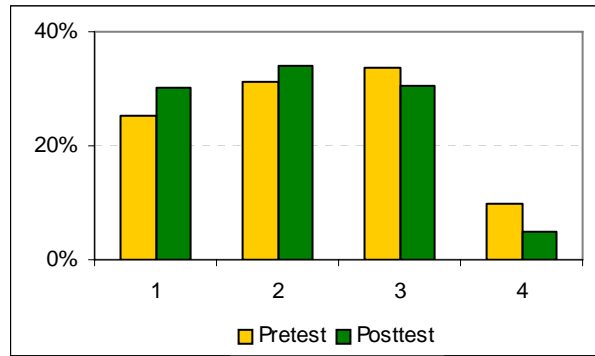
Responses	Pre-test	Post-test
NO!	219	233
No	99	64
Yes	48	29
YES!	39	13
Total	405	339
p-value < 0.001		
<b>Very significant improvement!</b>		



**Item: I feel useless at times**

**Response Frequencies**

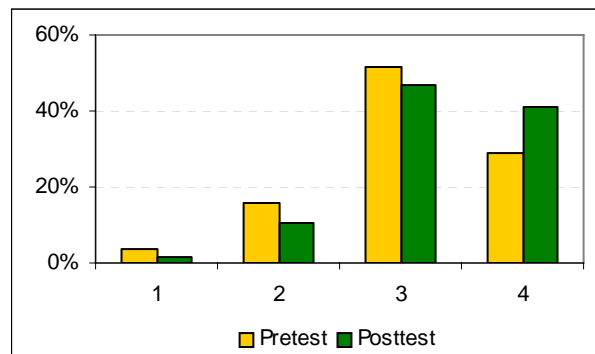
Responses	Pre-test	Post-test
NO!	102	102
No	126	115
Yes	137	103
YES!	40	17
Total	405	337
p-value = 0.038		
<b>No significant change</b>		



**Item: I have a lot to offer to people**

**Response Frequencies**

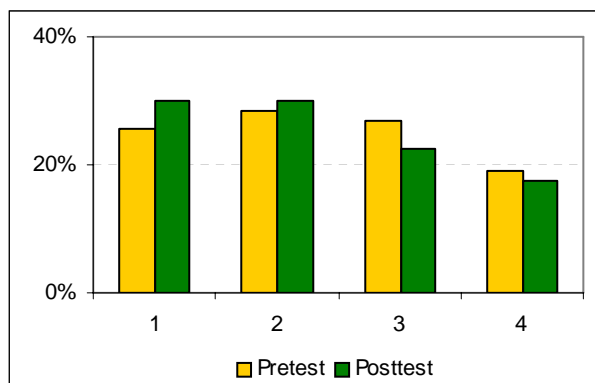
Responses	Pre-test	Post-test
NO!	14	5
No	64	35
Yes	207	157
YES!	117	138
Total	402	335
p-value = 0.002		
<b>Significant improvement</b>		



**Item: I wish I could have more respect for myself**

**Response Frequencies**

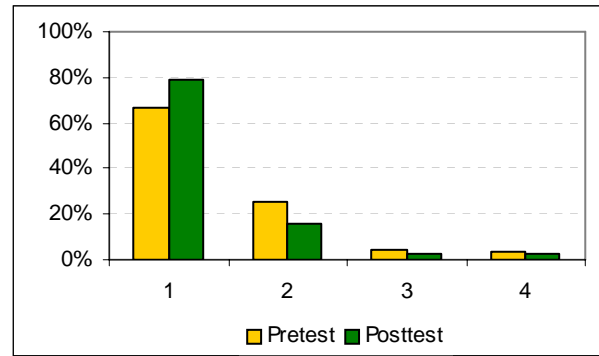
Responses	Pre-test	Post-test
NO!	104	102
No	115	102
Yes	108	76
YES!	77	59
Total	404	339
p-value = 0.379		
<b>No significant change</b>		



**Item: I feel that I am a failure**

**Response Frequencies**

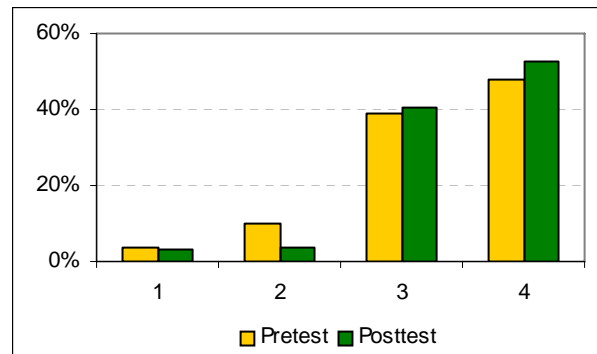
Responses	Pre-test	Post-test
NO!	268	268
No	104	55
Yes	17	8
YES!	14	8
Total	403	339
p-value = 0.002		
<b>Significant improvement</b>		



**Item: I have a positive attitude toward myself**

**Response Frequencies**

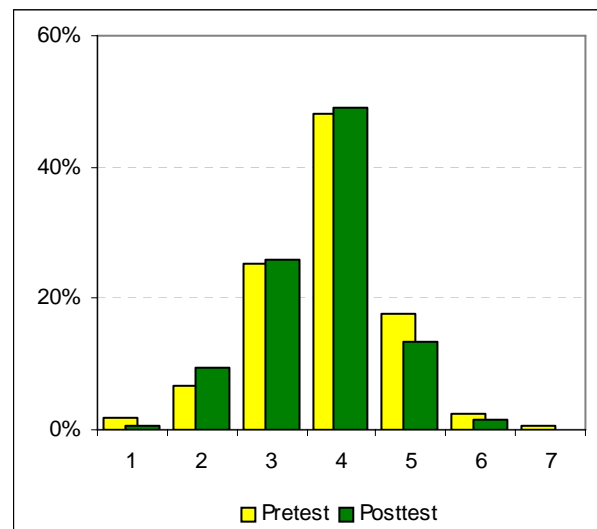
Responses	Pre-test	Post-test
NO!	14	10
No	40	12
Yes	156	137
YES!	193	178
Total	403	337
p-value = 0.008		
<b>Significant improvement</b>		



**Item: Circle body shape which you think looks like you**

**Response Frequencies**

Responses	Pre-test	Post-test
1 (thin)	7	2
2	27	32
3	102	87
4 (average)	193	165
5	71	45
6	10	5
7 (large)	2	0
Total	402	336
Mean	3.8	3.7
p-value = 0.066 (paired t-test)		
<b>No significant change</b>		



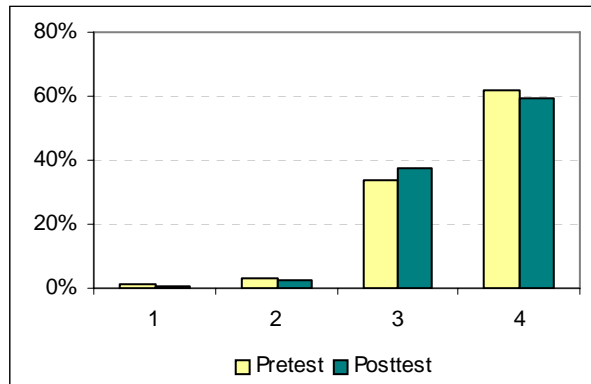
## Responses to Individual Questions on Survey

### Items with regards physical activity commitment

**Item: I look forward to physical activity**

**Response Frequencies**

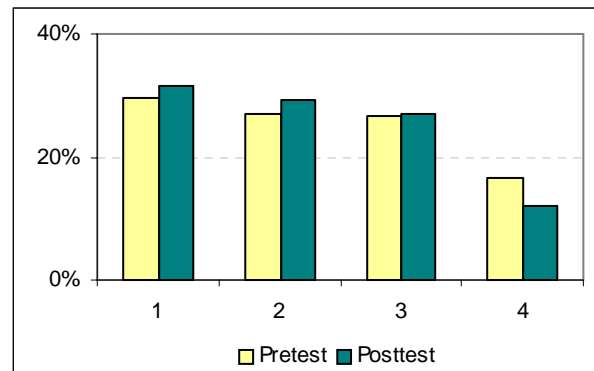
Responses	Pre-test	Post-test
NO!	6	2
No	12	9
Yes	136	127
YES!	248	200
Total	402	338
<b>No change (p-value = 0.50)</b>		



**Item: I wish there were better ways to get healthy than being physically active**

**Response Frequencies**

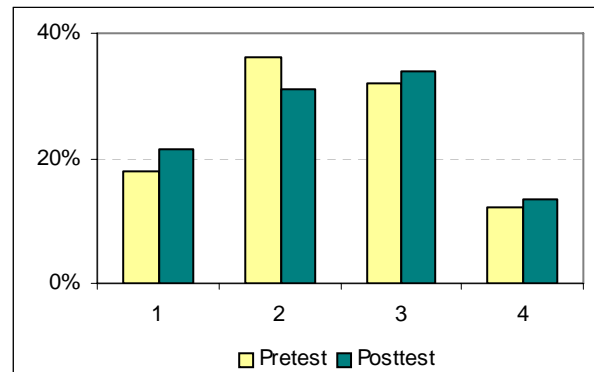
Responses	Pre-test	Post-test
NO!	119	106
No	108	99
Yes	107	91
YES!	66	41
Total	400	337
<b>No change (p-value = 0.41)</b>		



**Item: Physical activity is hard work**

**Response Frequencies**

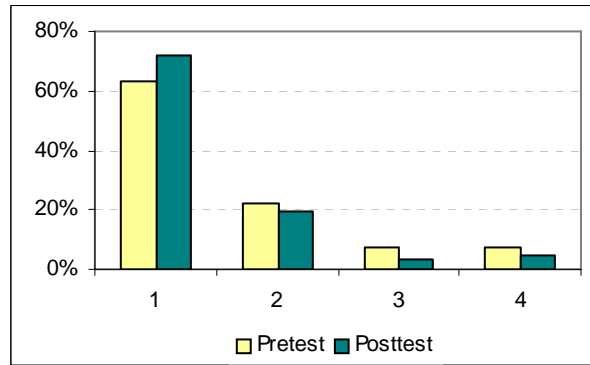
Responses	Pre-test	Post-test
NO!	72	72
No	146	104
Yes	129	114
YES!	49	45
Total	403	335
<b>No change (p-value = 0.38)</b>		



**Item: I do not enjoy physical activity**

**Response Frequencies**

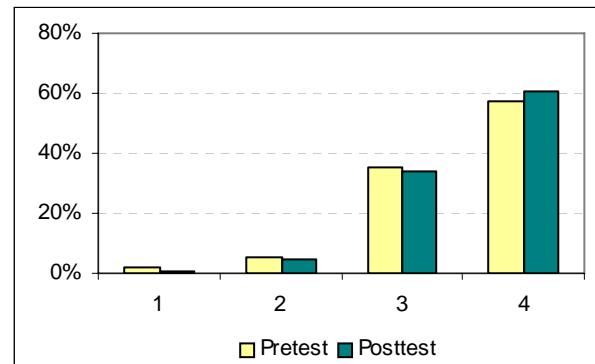
Responses	Pre-test	Post-test
NO!	253	239
No	88	66
Yes	31	12
YES!	29	16
Total	401	333
<b>Slight improvement (p-value = 0.02)</b>		



**Item: Physical activity is very important to me**

**Response Frequencies**

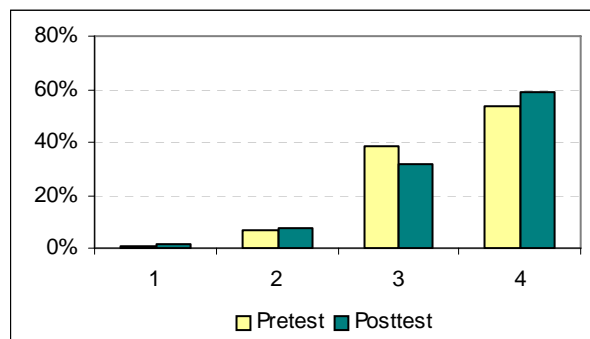
Responses	Pre-test	Post-test
NO!	9	2
No	21	16
Yes	141	115
YES!	229	203
Total	400	336
<b>No change (p-value = 0.28)</b>		



**Item: Life is better because I am physically active**

**Response Frequencies**

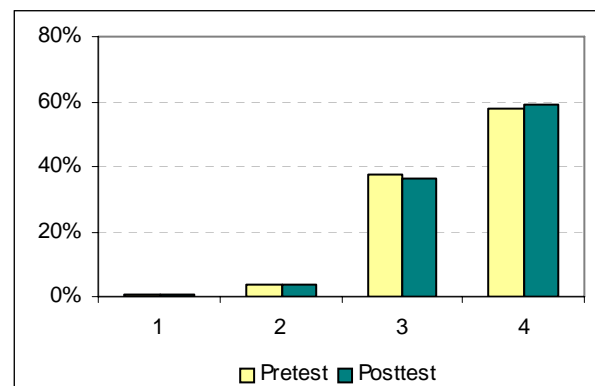
Responses	Pre-test	Post-test
NO!	4	4
No	28	26
Yes	154	108
YES!	214	199
Total	400	337
<b>No change (p-value = 0.34)</b>		



**Item: Physical activity feels good**

**Response Frequencies**

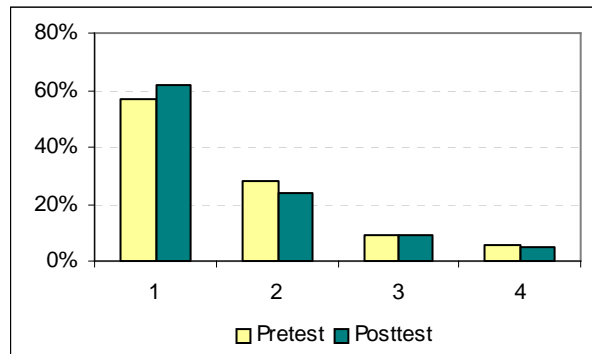
Responses	Pre-test	Post-test
NO!	3	2
No	15	13
Yes	150	120
YES!	231	195
Total	399	330
<b>No change (p-value = 0.98)</b>		



**Item: I don't like thinking about doing physical activity**

**Response Frequencies**

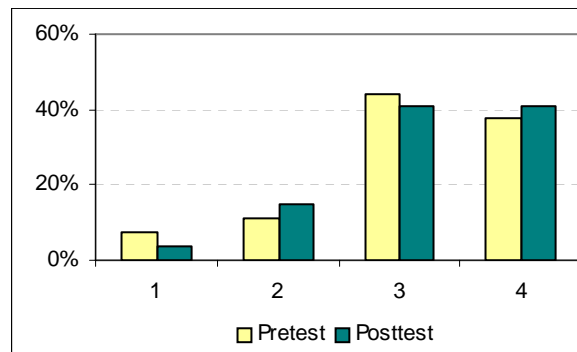
Responses	Pre-test	Post-test
NO!	228	207
No	114	80
Yes	37	31
YES!	23	16
Total	402	334
<b>No change (p-value = 0.48)</b>		



**Item: I would change my schedule to participate in physical activity**

**Response Frequencies**

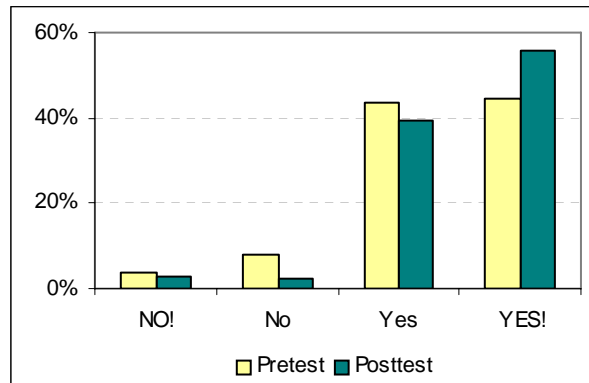
Responses	Pre-test	Post-test
NO!	29	13
No	45	49
Yes	174	135
YES!	149	135
Total	397	332
<b>No change (p-value = 0.11)</b>		



**Item: I have to force myself to physically active**

**Response Frequencies**

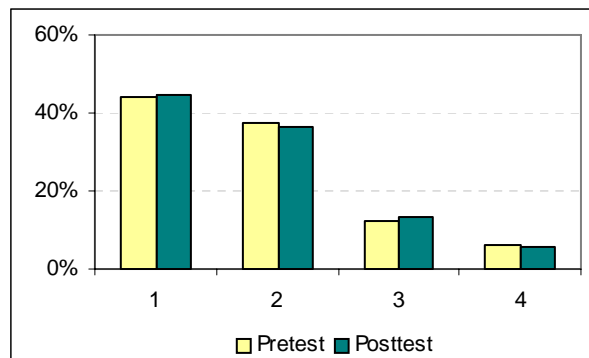
Responses	Pre-test	Post-test
NO!	204	211
No	124	98
Yes	41	18
YES!	33	8
Total	402	335
<b>Significant change (p-value&lt;0.001)</b>		



**Item: I do not like being physically active every day**

**Response Frequencies**

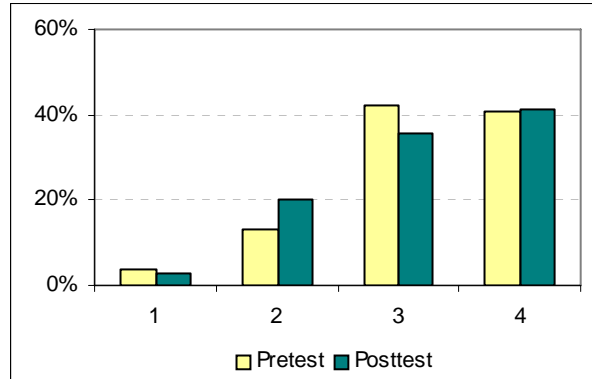
Responses	Pre-test	Post-test
NO!	175	150
No	148	122
Yes	50	44
YES!	25	19
Total	398	335
<b>No change (p-value = 0.98)</b>		



**Item: Physically activity is the best part of the day**

**Response Frequencies**

Responses	Pre-test	Post-test
NO!	14	9
No	52	67
Yes	167	119
YES!	161	138
Total	394	333
<b>No change (p-value = 0.05)</b>		



**Item: How many of the past 7 days did you exercise?**

**Response Frequencies**

Responses	Pre-test	Post-test
0	10	6
1	22	14
2	43	26
3	48	31
4	48	53
5	64	60
6	44	46
7	125	102
Total	404	338
Mean	4.7	4.9
<b>p-value = 0.318 (paired t-test)</b>		
<b>No significant change</b>		

