Healing Wave Aquatics

PCL-M Data Analysis Report

August 19, 2021

LEGEND:

Statistical Measures

Statistics

Analysis of Statistics

2015-2021

The PCL-M is a test that measures self-reported post-traumatic stress (PTS) symptoms specifically for those in the military as defined by the Diagnostic and Statistical Manual of Mental Disorders (DSM-5).Each Healing Wave Aquatics client is offered a Pre PCL-M test, our full 8 week program, and our Post PCL-M test. Over the last six and a half years, we have had 318 (N) clients complete all 3 of these. The data presented below represents only those who completed the pre and post PCL-M surveys alongside our full 8 session program.

Descriptives - Data

Descriptives

Descriptives

	2015-2021 Pre-PCLM	2015-2021 Post PCLM
N	317	317
Mean	60.6	47.5
Median	62	47
Mode	63.0 [a]	45.0
Standard deviation	13.0	15.6
Minimum	17	17
Maximum	85	85
25th percentile	54.0	35.0
50th percentile	62.0	47.0
75th percentile	70.0	59.0

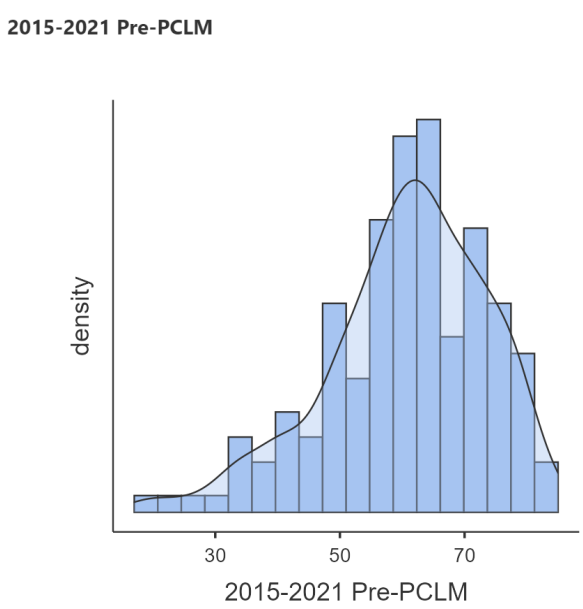
[a] More than one mode exists, only the first is reported

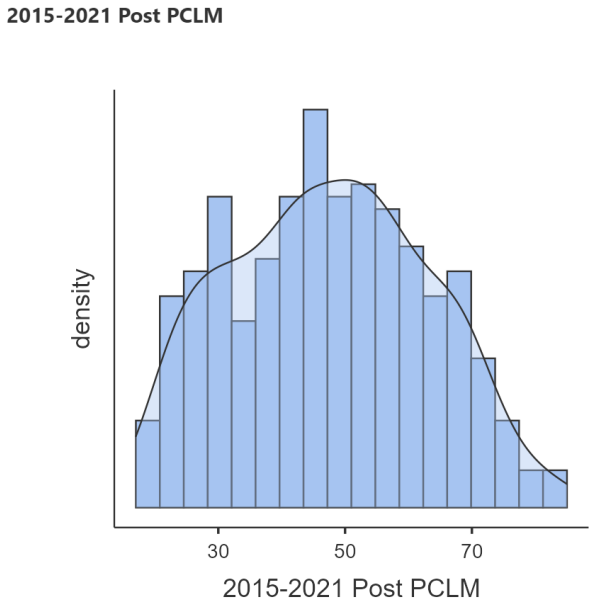
Descriptives - Analysis

In the initial descriptives of the sample, we can see that the lowest possible score (Minimum) is a 17, indicating an individual who chose all 1s on each of the 17 questions with a likert scale of 1-5. The highest possible score (Maximum) is an 85, and indicates an individual reporting feeling the highest level of each post-traumatic stress symptom.

When comparing the average (Mean) scores, we see that before our program, the mean was 60.6, while after our program, the mean was 47.5. This equates to a 21.6% decrease in PTS symptoms after our program. By looking at the exact middle (Median) scores, we are able to see if the means were affected by outlier data points. The median of the Pre PCL-M score is 62, compared to the mean of 60.6, shows that no significant outliers are affecting the overall data. The same result comes with the Post PCL-M data, with a median of 47.0, which is almost identical to the mean of 47.5.

Density Plots - Data





Density Plots - Analysis

Shown above are both of the bar graphs (Histogram) and the line graphs (Density Plot) for the data points of PCL-M scores. The Pre PCL-M dual graph is negatively skewed; the data points are highly concentrated in higher scores. This signals that most of our clients are experiencing high levels of PTS symptoms.

The Post PCL-M graph resembles a normal bell curve. We can also see this by looking at the mean, median and mode (47.5, 47, 45 respectively). When we have a normal distribution, we expect to see very similar results for each of these statistics. This means that we are seeing an average in the middle of the data set and about 50% on either side of that center point.

By looking at the graphs, we can notice the overall downward shift in scores from before our program to after. The negative skew towards self-reports of higher PTS symptoms is eliminated in the Post PCL-M measurement. Not only do we see the peak of the graph (Mode) shift downward, but the entire data set follows in that direction.

Paired Samples T Test - Data

Paired Samples T-Test

Paired Samples T-Test

			statistic	df	p	Mean difference	SE difference		Effect Size
2015-2021 Pre-PCLM	2015-2021 Post PCLM	Student's t	16.6	316	< .001	13.2	0.791	Cohen's d	0.934

Note. H_a $\mu_{\text{Measure 1 - Measure 2}} > 0$

Paired Samples T Test - Analysis

Above is the Paired Samples T Test for the Pre PCL-M scores and the Post PCL-M scores. A Paired Samples T Test takes two data sets and tests whether the mean difference between the two sets is zero. In this test, our hypothesis was that Measure 1 (Pre PCL-M) is greater than Measure 2 (Post PCL-M).

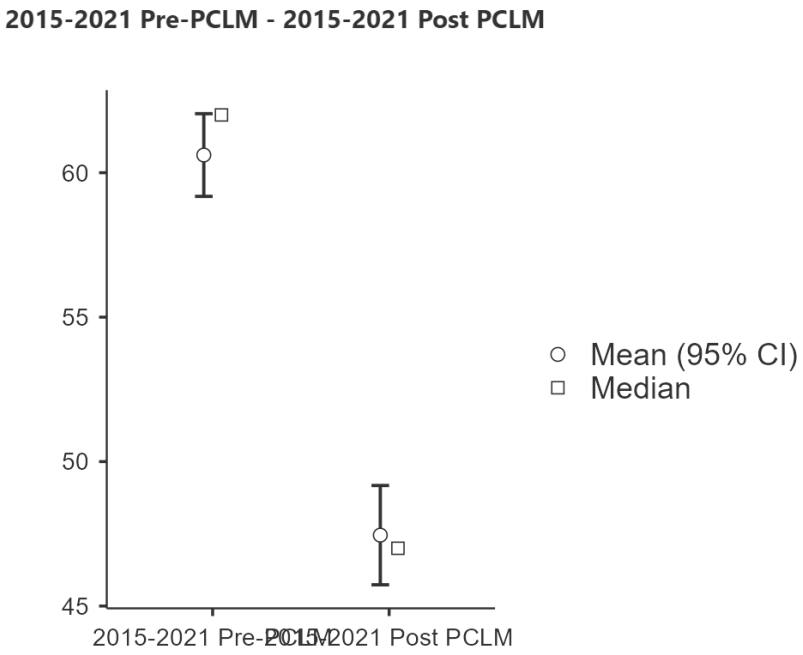
To understand our p value, we must first assume our hypothesis is not true. Our new hypothesis, known as the null hypothesis, is that Measure 1 is less than or equal to Measure 2 in the full population. Our p value will then tell us that if our null hypothesis is true, what are the odds to find these data points in our sample set. If our p value is less than 0.05 (5% chance), we can reject the null hypothesis. A p value of less than 0.05 is statistically significant that your original hypothesis (alternate hypothesis) is true.

The p value for the Paired Samples T Test less than 0.001. This means that if Measure 1 was not greater than Measure 2 in the population, there is less than a 0.1% chance to find this particular data set in our sample. Therefore, we can reject the null hypothesis and conclude that statistically, there is a decrease from our Pre PCL-M to our Post PCL-M.

We can also look at our Cohen's d Effect Size to find the magnitude to which the means differ between the two groups. The Cohen's d value is 0.934. A Cohen's d value above 0.8 signifies a large effect size. That means that there is a clear and noticeable difference between the means of the Pre PCL-M and the Post PCL-M.

Plots - Data

Plots



Plots - Analysis

These plots show the median, mean, and a 95% confidence interval for both data sets. We are 95% sure, from our sample, that the mean in the true population lies within the range of that confidence interval. Even with our confidence intervals, there is a large gap between the data sets. There is a significant decrease from the Pre PCL-M scores to the Post PCL-M data set.