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Project Title:
Weekly Assessment Project

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Duration of the Study:
March 2017 – September 2017

Synopsis:
AToN Center strives to provide the highest quality of care to residents in treatment. Therefore, it is essential to assess resident's symptoms to have a clear and unbiased understanding of their progress and barriers to improvement. These assessments will provide important feedback enabling AToN Center to modify individual treatment programming as needed.

Specific Aims:
To calculate resident's self reported change in the following dimensions each week while in residency at AToN Center:
1) Urges to Drink or Use
2) Physical Symptoms
3) Obsessive Compulsive Symptoms
4) Interpersonal Sensitivity

5) Depression Symptoms
6) Anxiety Symptoms
7) Irritability/Hostility Symptoms
8) Phobic Symptoms
9) Paranoid Ideation
10) Psychotic Symptoms
11) Overall Severity of Symptoms

Assessments

In an effort to improve treatment, AToN Center implemented a weekly assessment protocol. The Principle Investigator at AToN Center researched a number of assessments via literature review as well as assessments recommended by the Joint Commission itself.

Unfortunately, many assessments were unsuitable for AToN Center – as many of them ask the respondent to reference the last year, month, or two weeks during the questionnaires. As the length of treatment at AToN averages around thirty days, a weekly assessment is most acceptable for AToN's purposes. Additionally, many assessments were most appropriate for outpatient populations or the intent of use was for those with Borderline Intellectual Functioning (as in the Quality of Life Measurement). The following assessments were reviewed and deemed unsuitable for various reasons: PHQ-9, Altman Scale, GAD-&, PCL, PDSS SR, AUDIT – C, DAST 10, PHQ – 15, Substance Abuse Outcomes Module, Brief Addiction monitor, Functional Outcomes Survey, Daily Living Activities (DLA – 20), WHO Disability Assessment Schedule, OQ-45.2, M-3 Checklist, BH-Works, SF-12, Wellness Assessment, Addiction Severity Index, Addiction Treatment Services Review and Quality of Life (QoL) measurement. AToN Center opted to utilize the Urge to Use Scale and the Brief Symptom Inventory as described below.

<u>Urge to Use –</u>

The Urge to Use Scale can also be called the Urge to Drink Scale. As residents at AToN are diagnosed with both alcohol and other substance use disorders, the Urge to Use Scale was utilized and the terms "drink" and "use" can be interchanged without issue. This scale is a modified version of the Penn Alcohol Craving Scale and is used by the Los Angeles County Department of Mental Health. This scale is five questions long and asks respondents to refer to the past week while assessing the number of thoughts of using, the intensity of urge to use, how much time was spent thinking about using and overall urge to use. The respondents utilize a likert scale (0-6) and the maximum score is 30. A score of ten or higher is considered clinically significant.

According to Flannery, Volpicelli and Pettinati (1999), this scale is a "reliable and valid measure of craving and can predict which individuals are at risk for subsequent relapse."

These authors cite a high degree of internal consistency with a Cronbach's Alpha coefficient of 0.92. Construct validity was assessed by comparing this measure to the OCDS and AUQ scores with P values less than 0.001 for both measures. Regarding discriminant validity, this measure was able to be separated from the ASI composite scores. Logistical analysis of craving scores and subsequent relapse status demonstrated a significant relationship (p=.001), establishing good predictive validity. For further details, please refer to Volpicelli, et. al (1999).

Brief Symptom Inventory

The Brief Symptom Inventory (BSI) is a 53 item questionnaire that assesses the following domains: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism. It also allows one to compare t-scores on a Global Severity Index and a Positive Symptom Distress Index (measuring the intensity of symptoms). This inventory asks participants to rate the extent to which they have been bothered by various symptoms within the last week. This measure was normed on adult nonpatient, adult outpatient and adult inpatient groups. As AToN Center residents are neither outpatient OR inpatient (but the grey area in between), AToN utilized the inpatient norms as they appeared to be more closely in line with the population at AToN; however it should be noted that it is likely that the average t-scores may be lower than inpatient populations – as expected. An average t-score is 50, standard deviations are 10 points (positive and negative).

An explanation of the BSI's subscales are as follows:

Somatization – this dimension assesses for distress related to bodily dysfunction. This dimension reflects withdrawal and post acute withdrawal symptoms – as well as other medical concerns.

Obsessive Compulsive – reflects symptoms related to obsessive compulsive disorder, including unremitting and irresistible thoughts, impulses and actions. Strong urges and cravings could also be reflected in this domain.

Interpersonal Sensitivity – assesses for feelings of personal inadequacy in comparison to others as well as discomfort during interpersonal interactions.

Depression – demonstrates a representative range of the indicators of clinical depression.

Anxiety – signs of nervousness, tension, panic and feelings of terror are assessed.

Hostility – includes thoughts, feelings and/or actions that correlate with anger.

Phobic Anxiety – defined as a persistent fear response that is irrational and/or out of proportion to stimuli. This particularly assesses for avoidance behaviors.

Paranoid Ideation – this subscale represents paranoid behavior and disorganized thinking. This scale may be elevated in AToN's sample due to the following questions: "feeling others are to blame for most of your troubles," "feeling that you are watched or talked about by others," and "others not giving your proper credit for your achievements."

Psychoticism – This scale is elevated when one endorses withdrawal, isolation, interpersonal alienation and dramatic psychosis.

Global Severity Index – is the mean of all 53 items. It reflects both the number of symptoms and intensity of perceived distress.

Positive Symptom Total – this represents the number of items of endorsed symptomology, or the total number of symptoms.

Positive Symptom Distress Index – This score represents the intensity of distress symptoms endorsed.

Internal consistency reliability for the scale was determined by alpha coefficients to be very good – ranging from 71 to 85. Test-retest reliability reflects consistency of measurement across time with coefficients ranging from .68 to .90; providing strong evidence that the BSI represents consistent measurement across time. Regarding convergent validity, the BSI shows "impressive convergent validity" with the MMPI (Derogatis, 1993) with coefficients greater than .3 between the BSI and the MMPI. Researchers have used the BSI with many different populations, including cancer populations, psychoneuroimmunology, psychopathology, pain assessment/management, therapeutic interventions, HIV research, hypertension research and student mental health. Please refer to the Brief Symptom Inventory "Administration, Scoring, and Procedures Manual" for further information.

Data Collection

Completed Study	52	60%
Planned Discharge	10	12%
Insurance Denial	7	8%

From March 2017 through September 2017, eighty - six residents agreed to participate in this project. By then end of the project, 52 residents completed four weekly assessments. See the tables below for an understanding of drop out levels by week and reasons for drop out:

AMA Discharge	7	8%
Administrative Discharge	1	1%
Unknown (Staff Error)	9	11%

Week 1	86
Week 2	76
Week 3	66
Week 4	52

Statistical Analysis

A one way repeated measures analysis of variance (ANOVA) was conducted on the following domains from "time one" through "time four:"

- Urge to Use
- Somatization
- Obsessive Compulsive
- Interpersonal Sensitivity
- Depression
- Anxiety
- Hostility
- Phobic Anxiety
- Paranoid Ideation
- Psychoticism
- Global Severity Index
- Positive Symptom Total
- Positive Symptom Distress

<u>Urge to Use</u>

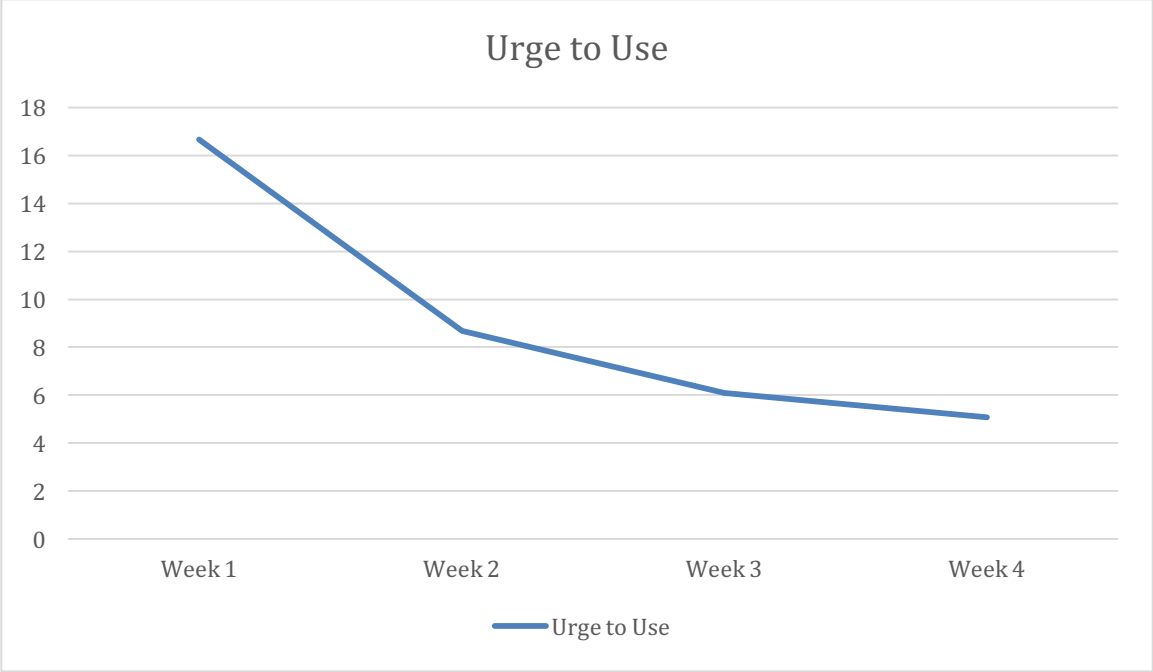
It is important to remember that the Urge to Use assessment has a minimum score of zero and a maximum score of thirty. A lower score indicates less urges to use and a score of ten or higher indicates significant urges and cravings. In reviewing the statistical analyses, it is important to keep the following parameters in mind:

Statistical Significance: $P<.05$

Effect Size (Partial Eta Squared): Small - .01, Medium - .06, Large - .14

A one way repeated measure ANOVA was conducted compare scores on the Urge to Use Scale from Time 1, Time 2, Time 3 and Time 4. The means and standard deviations are presented in the table below:

Time Period	N	Mean	Standard Deviation
Week 1	49	16.67	8.49
Week 2	49	8.69	6.64
Week 3	49	6.08	5.29
Week 4	49	5.08	5.62



There was an overall significant effect for time, Wilks' Lambda=.31, F (3, 46)=34.19, p= .000, partial eta squared = .69. This is considered a large effect. Post hoc tests using the Bonferroni correction revealed that the difference in urge to use from Time 1 (16.67, ± 8.49) to Time 2 (8.69, ±6.64) was statistically significant (p=.000). The difference in urge to use from Time 2 (8.69, ±6.64) to Time 3 (6.08, ±5.29) was also statistically significant (p=.000). The urge to use from Time 3 (6.08, ±5.29) to Time 4 (5.08, ±5.62) was *not* statistically significant (p=.174).

Brief Symptom Inventory

When reviewing the results for the domains of the Brief Symptom Inventory – one should keep in mind that the following scores are t-scores. A t-score of 50 is considered average, while a t-score of 60 is considered one standard deviation above the mean. Conversely, a t-score of 40 is considered one standard deviation below the mean. Therefore, a t-score of 60 or above or 40 and below should be considered significantly

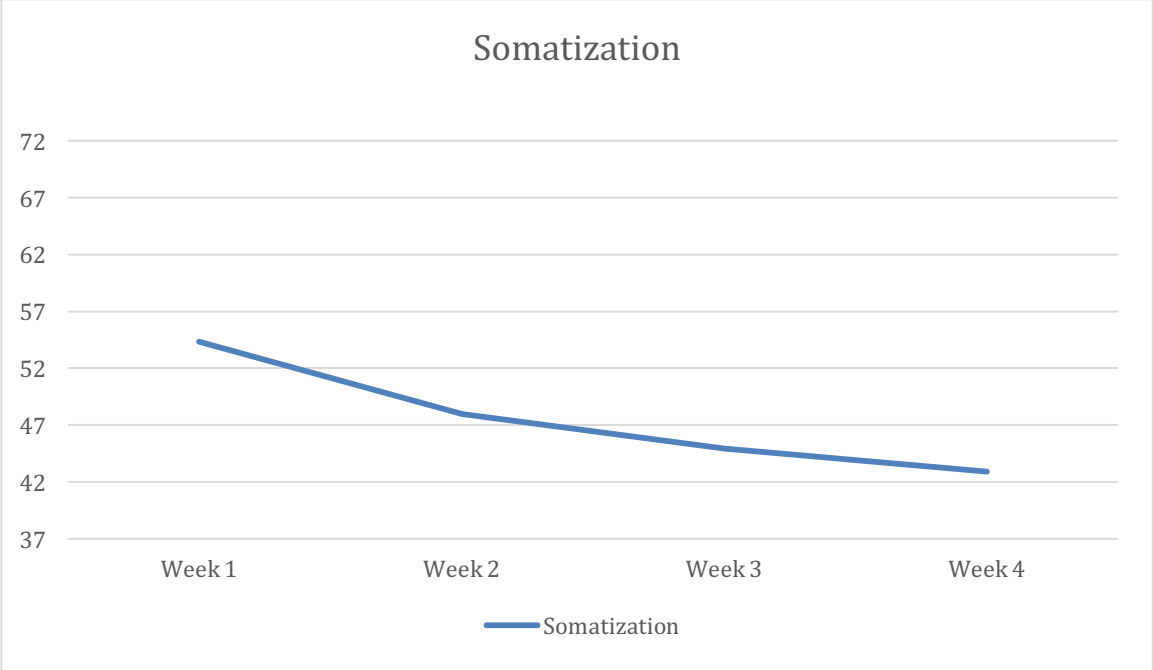
out of the average range. An additional note, the Brief Symptom Inventory was normed on psychiatric inpatients; therefore these scores are compared to that population.

Somatization

For the somatization scale, if one endorsed no symptoms, their t-score would be 37; if they endorsed every symptom, their t-score would be 75.

A one way repeated measure ANOVA was conducted compare scores on the Somatization subscale from Time 1, Time 2, Time 3 and Time 4. The means and standard deviations are presented in the table below:

Time Period	N	Mean	Standard Deviation
Week 1	50	54.32	9.39
Week 2	50	47.94	9.22
Week 3	50	44.94	8.28
Week 4	50	42.88	7.96



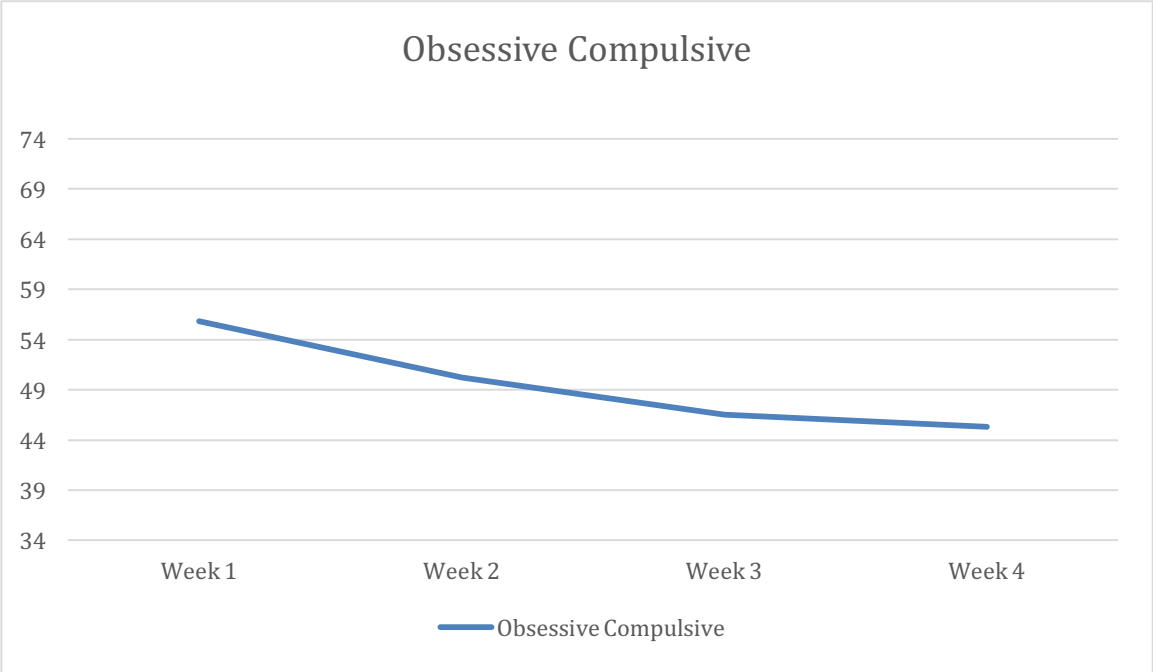
There was an overall significant effect for time, Wilks' Lambda=.361, F (3, 47)=27.71, p= .000, partial eta squared = .64. This is considered a large effect. Post hoc tests using the Bonferroni correction revealed that the difference in somatization from Time 1 (54.32, ± 9.39) to Time 2 (47.94 ±9.22) was statistically significant (p=.000). The difference in somatization from Time 2 (47.94 ±9.22) to Time 3 (44.94, ±8.28) was *not* statistically significant (p=.079). The somatization scale from Time 3 (44.94, ±8.28) to Time 4 (42.88, ±8.28) was also *not* statistically significant (p=.491).

Obsessive Compulsive

For the obsessive compulsive scale, if one endorsed no symptoms, their t-score would be 34; if they endorsed every symptom, their t-score would be 77.

A one way repeated measure ANOVA was conducted compare scores on the Obsessive Compulsive subscale from Time 1, Time 2, Time 3 and Time 4. The means and standard deviations are presented in the table below:

Time Period	N	Mean	Standard Deviation
Week 1	50	55.86	10.23
Week 2	50	50.24	10.17
Week 3	50	46.54	9.89
Week 4	50	45.34	10.23



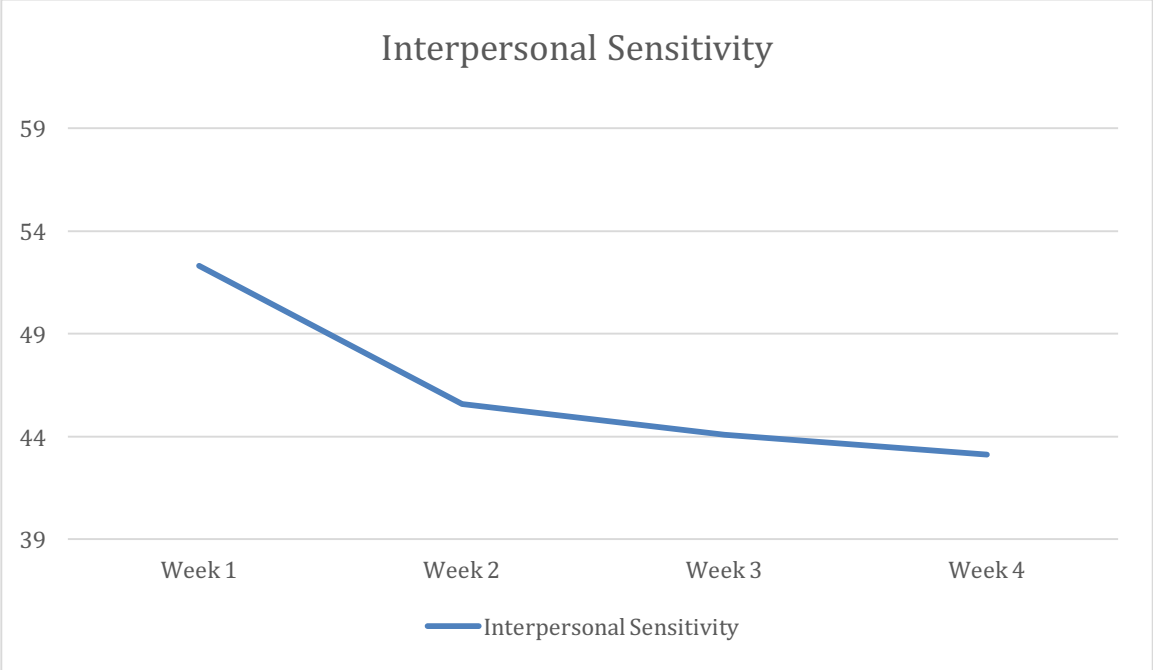
There was an overall significant effect for time, Wilks' Lambda=.403, F (3, 47)= 23.17, p= .000, partial eta squared = .597. This is considered a large effect. Post hoc tests using the Bonferroni correction revealed that the difference in obsessive compulsive symptoms from Time 1 (55.86, ± 10.23) to Time 2 (50.24 ±10.17) was statistically significant (p=.000). The difference in obsessive compulsive symptoms from Time 2 (50.24 ±10.17) to Time 3 (46.54, ±9.89) was also statistically significant (p=.000). The obsessive compulsive subscale from Time 3 (46.54, ±9.89) to Time 4 (45.34, ±10.23) was *not* statistically significant (p=.716).

Interpersonal Sensitivity

For the interpersonal sensitivity scale, if one endorsed no symptoms, their t-score would be 39; if they endorsed every symptom, their t-score would be 77.

A one way repeated measure ANOVA was conducted compare scores on the interpersonal sensitivity subscale from Time 1, Time 2, Time 3 and Time 4. The means and standard deviations are presented in the table below:

Time Period	N	Mean	Standard Deviation
Week 1	50	52.30	11.20
Week 2	50	45.58	9.14
Week 3	50	44.10	8.79
Week 4	50	43.12	9.22



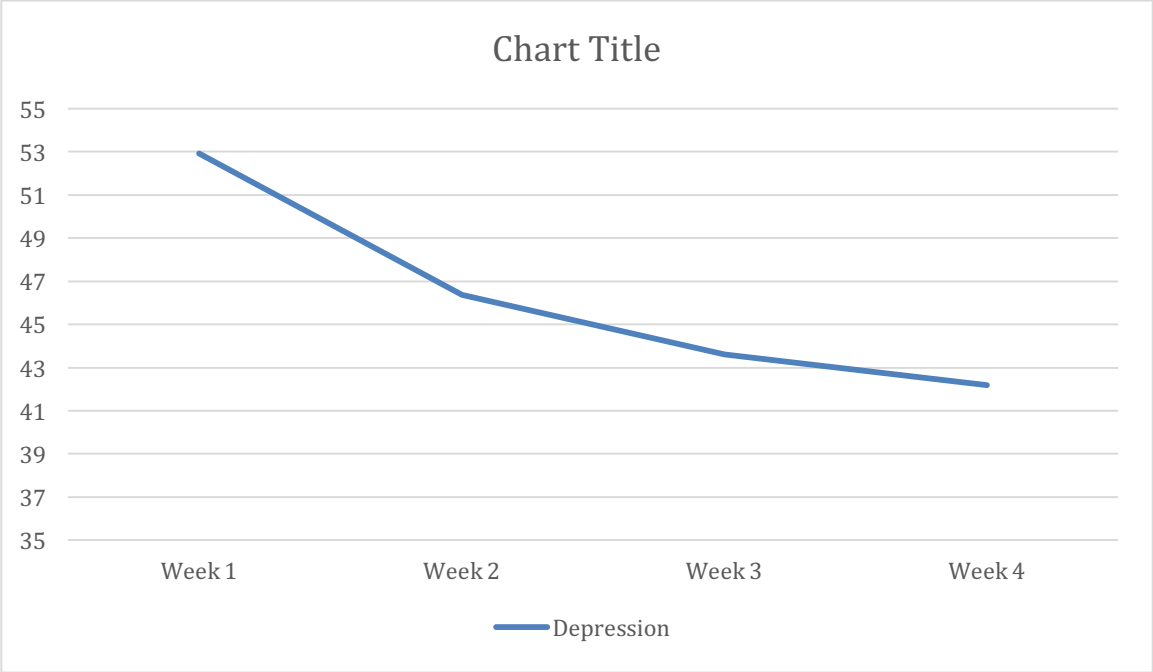
There was an overall significant effect for time, Wilks' Lambda=.515, F (3, 47)= 14.76, p= .000, partial eta squared = .485. This is considered a large effect. Post hoc tests using the Bonferroni correction revealed that the difference in interpersonal sensitivity symptoms from Time 1 (52.30, ± 11.20) to Time 2 (45.48 ±9.14) was statistically significant (p=.000). The difference in interpersonal sensitivity symptoms from Time 2 (45.48 ±9.14) to Time 3 (44.10, ±8.79) was *not* statistically significant (p=.326). The Interpersonal sensitivity subscale from Time 3 (44.10, ±8.79) to Time 4 (43.12, ±9.22) was also *not* statistically significant (p=.855).

Depression

For the depression scale, if one endorsed no symptoms, their t-score would be 35; if they endorsed every symptom, their t-score would be 77.

A one way repeated measure ANOVA was conducted compare scores on the depression subscale from Time 1, Time 2, Time 3 and Time 4. The means and standard deviations are presented in the table below:

Time Period	N	Mean	Standard Deviation
Week 1	50	52.92	7.56
Week 2	50	46.36	8.67
Week 3	50	43.62	8.18
Week 4	50	42.20	8.19



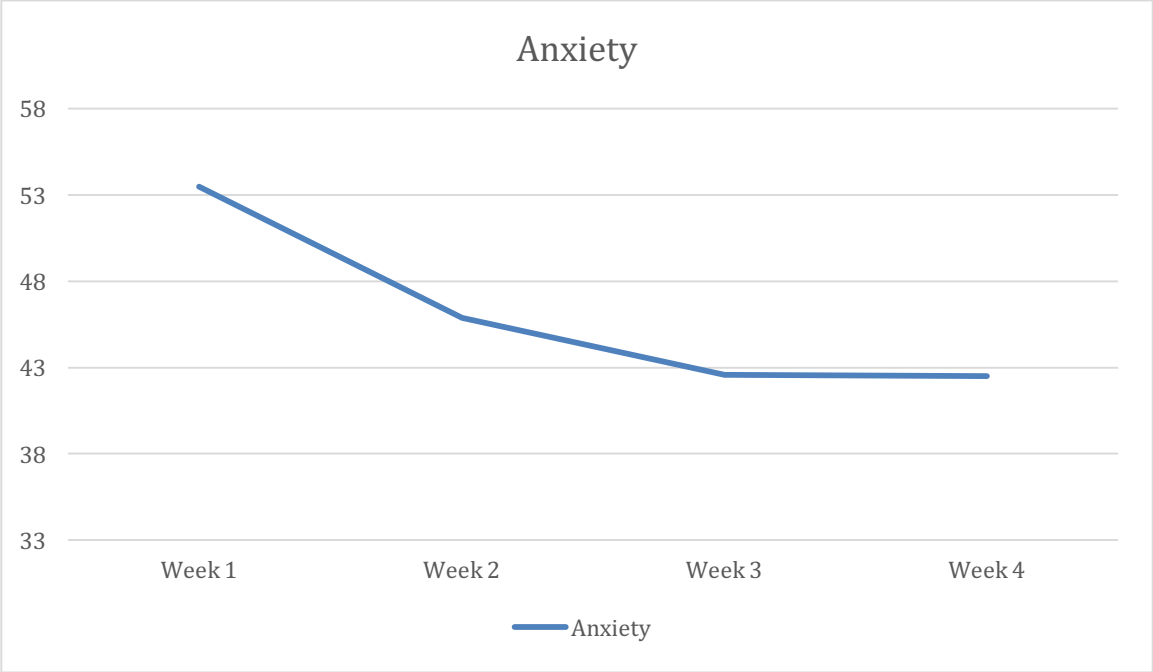
There was an overall significant effect for time, Wilks' Lambda=.328, F (3, 47)= 32.154, p= .000, partial eta squared = .672. This is considered a large effect. Post hoc tests using the Bonferroni correction revealed that the difference in depression symptoms from Time 1 (52.92, ± 7.56) to Time 2 (46.36 ±8.67) was statistically significant (p=.000). The difference in depression symptoms from Time 2 (46.36 ±8.67) to Time 3 (43.62, ±8.18) was also statistically significant (p=.002). The depression subscale from Time 3 (43.62, ±8.18) to Time 4 (42.20, ±8.19) was *not* statistically significant (p=.133).

Anxiety

For the anxiety scale, if one endorsed no symptoms, their t-score would be 33; if they endorsed every symptom, their t-score would be 77.

A one way repeated measure ANOVA was conducted compare scores on the anxiety subscale from Time 1, Time 2, Time 3 and Time 4. The means and standard deviations are presented in the table below:

Time Period	N	Mean	Standard Deviation
Week 1	50	53.46	7.73
Week 2	50	45.88	7.89
Week 3	50	42.58	8.02
Week 4	50	42.50	8.38



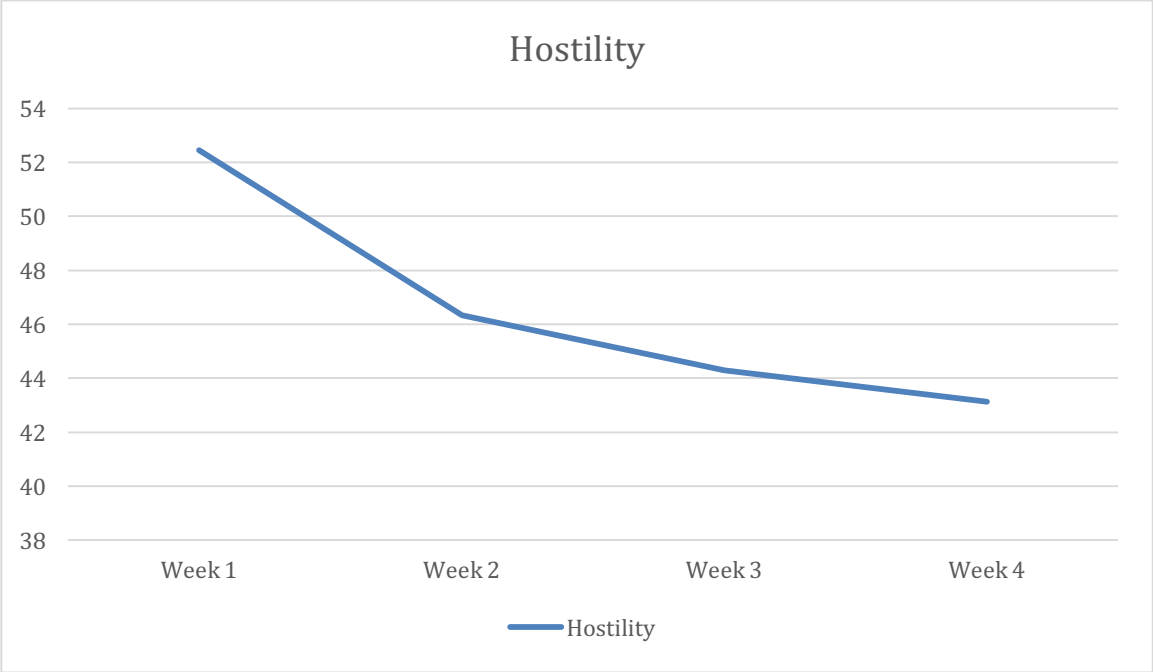
There was an overall significant effect for time, Wilks' Lambda=.257, F (3, 47)= 45.41, p= .000, partial eta squared = .743. This is considered a large effect. Post hoc tests using the Bonferroni correction revealed that the difference in anxiety symptoms from Time 1 (53.46, ± 7.73) to Time 2 (45.88 ±7.89) was statistically significant (p=.000). The difference in anxiety symptoms from Time 2 (45.88 ±7.89) to Time 3 (42.58, ±8.02) was also statistically significant (p=.008). The anxiety subscale from Time 3 (42.58, ±8.02) to Time 4 (42.50, ±8.38) was *not* statistically significant (p=1.00).

Hostility

For the hostility scale, if one endorsed no symptoms, their t-score would be 38; if they endorsed every symptom, their t-score would be 77.

A one way repeated measure ANOVA was conducted compare scores on the hostility subscale from Time 1, Time 2, Time 3 and Time 4. The means and standard deviations are presented in the table below:

Time Period	N	Mean	Standard Deviation
Week 1	49	52.45	8.96
Week 2	49	46.33	7.20
Week 3	49	44.29	7.34
Week 4	49	43.12	7.66



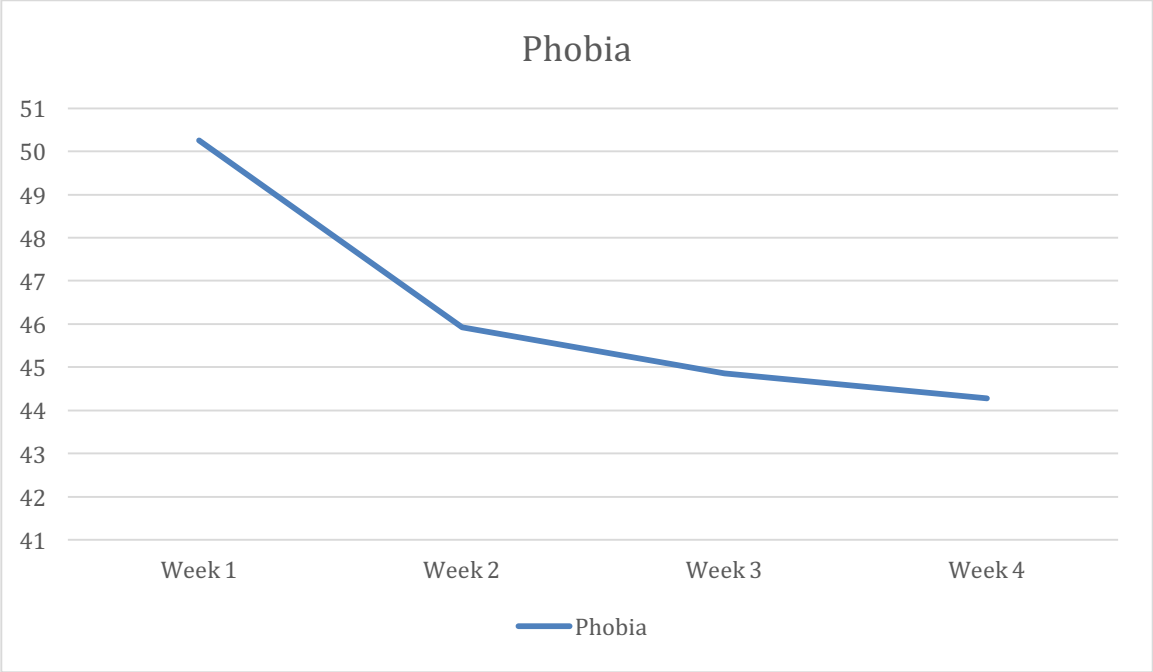
There was an overall significant effect for time, Wilks' Lambda=.481, F (3, 46)= 16.52, p= .000, partial eta squared = .519. This is considered a large effect. Post hoc tests using the Bonferroni correction revealed that the difference in hostility symptoms from Time 1 (52.45, ± 8.96) to Time 2 (46.33 ±7.20) was statistically significant (p=.000). The difference in hostility symptoms from Time 2 (46.33 ±7.20) to Time 3 (44.29, ±7.34) was (44.29, ±7.34) to Time 4 (43.12, ±7.66) was *not* statistically significant (p=.712).

Phobia

For the phobia scale, if one endorsed no symptoms, their t-score would be 41; if they endorsed every symptom, their t-score would be 77.

A one way repeated measure ANOVA was conducted compare scores on the phobia subscale from Time 1, Time 2, Time 3 and Time 4. The means and standard deviations are presented in the table below:

Time Period	N	Mean	Standard Deviation
Week 1	50	50.26	9.38
Week 2	50	45.92	7.44
Week 3	50	44.86	6.88
Week 4	50	44.28	6.79



There was an overall significant effect for time, Wilks' Lambda=.615, F (3, 47)= 9.82, p= .000, partial eta squared = .385. This is considered a large effect. Post hoc tests using the Bonferroni correction revealed that the difference in phobia symptoms from Time 1 (50.26, ± 9.38) to Time 2 (45.92 ±7.44) was statistically significant (p=.001). The difference in phobia symptoms from Time 2 (45.92 ±7.44) to Time 3 (44.86, ±6.88) was *not* statistically significant (p=1). The phobia subscale from Time 3 (44.86, ±6.88) to Time 4 (44.28, ±6.79) was also *not* statistically significant (p=1).

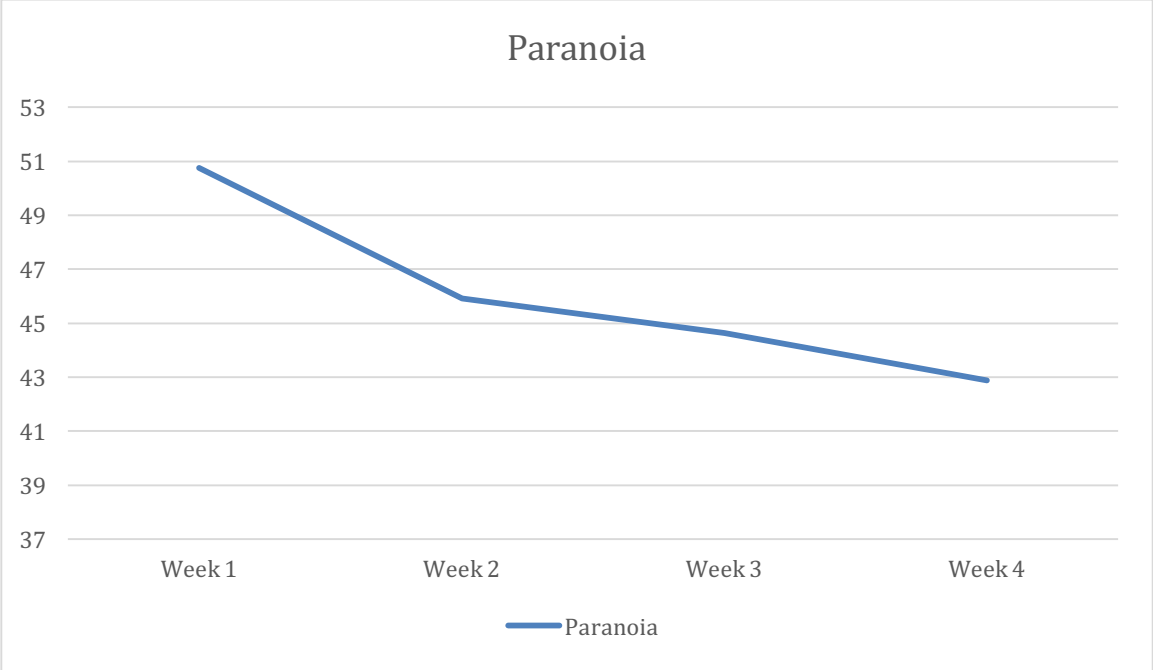
Paranoia

For the paranoia scale, if one endorsed no symptoms, their t-score would be 37; if they endorsed every symptom, their t-score would be 77.

A one way repeated measure ANOVA was conducted compare scores on the paranoia subscale from Time 1, Time 2, Time 3 and Time 4. The means and standard deviations are presented in the table below:

Time Period	N	Mean	Standard Deviation
Week 1	50	50.76	9.92

Week 2	50	45.92	8.76
Week 3	50	44.64	8.87
Week 4	50	42.88	8.99



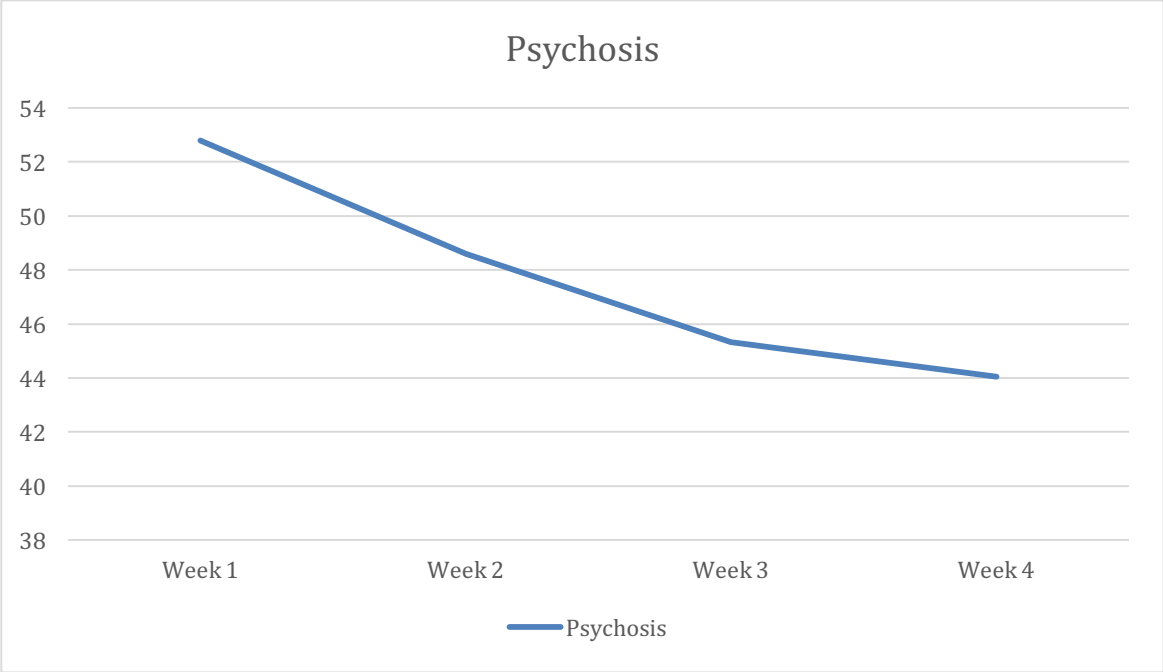
There was an overall significant effect for time, Wilks' Lambda=.49, F (3, 47)= 9.82, p= .000, partial eta squared = .510. This is considered a large effect. Post hoc tests using the Bonferroni correction revealed that the difference in paranoia symptoms from Time 1 (50.76, ± 9.92) to Time 2 (45.92 ±8.76) was statistically significant (p=.004). The difference in paranoia symptoms from Time 2 (45.92 ±8.76) to Time 3 (44.64, ±8.87) was *not* statistically significant (p=.958). The paranoia subscale from Time 3 (44.64, ±8.87) to Time 4 (42.88, ±8.99) was also *not* statistically significant (p=.107).

Psychosis

For the psychosis scale, if one endorsed no symptoms, their t-score would be 38; if they endorsed every symptom, their t-score would be 77.

A one way repeated measure ANOVA was conducted compare scores on the psychosis subscale from Time 1, Time 2, Time 3 and Time 4. The means and standard deviations are presented in the table below:

Time Period	N	Mean	Standard Deviation
Week 1	50	52.80	9.53
Week 2	50	48.60	9.18
Week 3	50	45.32	8.51
Week 4	50	44.04	8.28



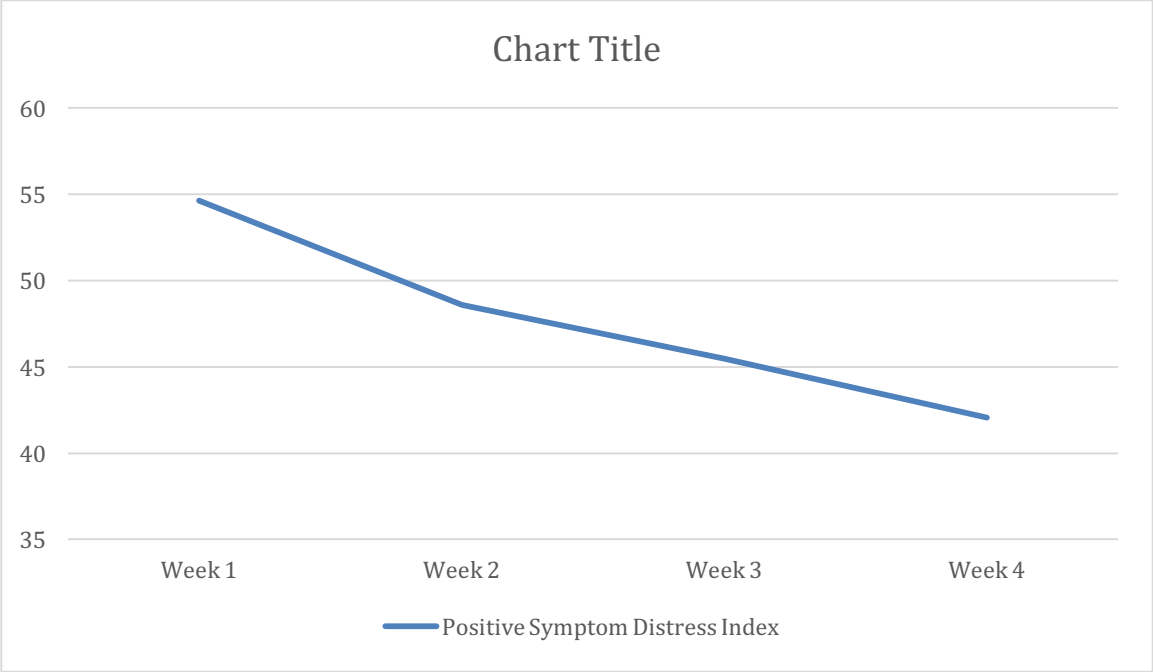
There was an overall significant effect for time, Wilks' Lambda=.39, F (3, 47)= 24.29, p= .000, partial eta squared = .608. This is considered a large effect. Post hoc tests using the Bonferroni correction revealed that the difference in psychosis symptoms from Time 1 (52.80, ± 9.53) to Time 2 (48.60 ±9.18) was statistically significant (p=.000). The difference in psychosis symptoms from Time 2 (48.60 ±9.18) to Time 3 (45.43, ±8.51) was also statistically significant (p=.000). The psychosis subscale from Time 3 (45.43, ±8.51) to Time 4 (44.04, ±8.28) was *not* statistically significant (p=.245).

Positive Symptom Distress Index

For the positive symptom distress index, if one endorsed no symptoms, their t-score would be 35; if they endorsed every symptom, their t-score would be 77.

A one way repeated measure ANOVA was conducted compare scores on the positive symptom distress index from Time 1, Time 2, Time 3 and Time 4. The means and standard deviations are presented in the table below:

Time Period	N	Mean	Standard Deviation
Week 1	50	54.62	7.35
Week 2	50	48.58	7.29
Week 3	50	45.48	7.23
Week 4	50	42.04	8.29



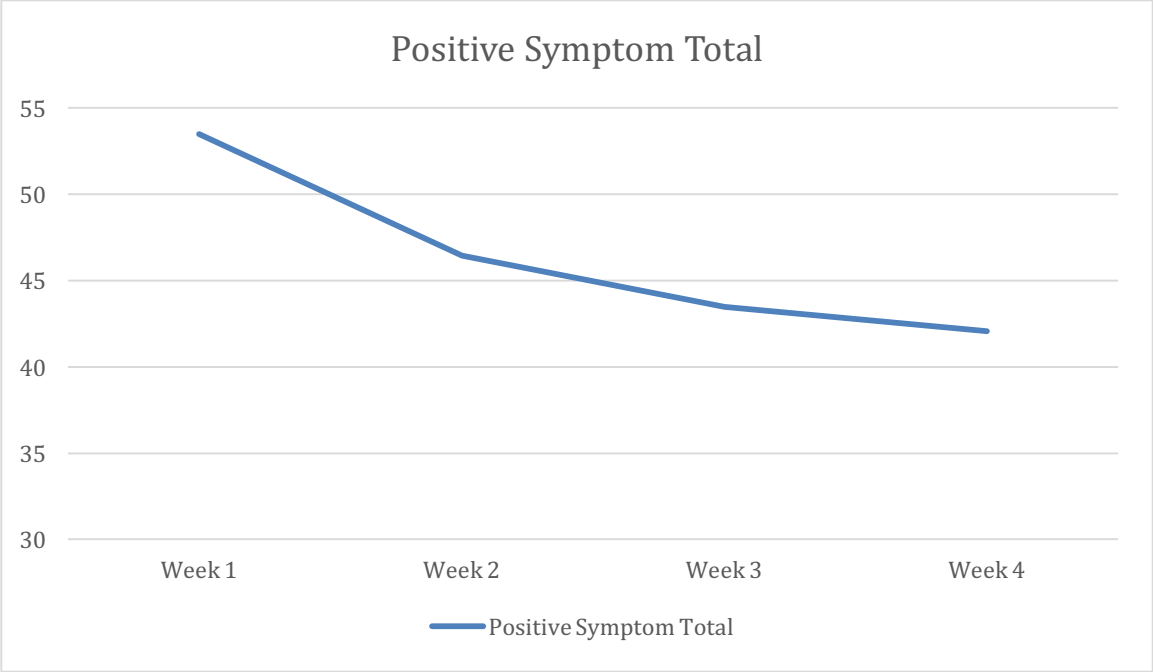
There was an overall significant effect for time, Wilks' Lambda=.27, F (3, 47)= 43.06, p= .000, partial eta squared = .733. This is considered a large effect. Post hoc tests using the Bonferroni correction revealed that the difference in the positive symptom distress index from Time 1 (54.62, ± 7.35) to Time 2 (48.58 ±7.29) was statistically significant (p=.000). The difference in the positive symptom distress index from Time 2 (48.58 ±7.29) to Time 3 (45.48, ±7.23) was also statistically significant (p=.000). The positive symptom distress index from Time 3 (45.48, ±7.23) to Time 4 (42.04, ±8.29) was also statistically significant (p=.003).

Positive Symptom Total

For the positive symptom total, if one endorsed no symptoms, their t-score would be 30; if they endorsed every symptom, their t-score would be 77.

A one way repeated measure ANOVA was conducted compare scores on the positive symptom total from Time 1, Time 2, Time 3 and Time 4. The means and standard deviations are presented in the table below:

Time Period	N	Mean	Standard Deviation
Week 1	50	53.48	9.21
Week 2	50	46.42	8.74
Week 3	50	43.46	9.31
Week 4	50	42.06	9.98



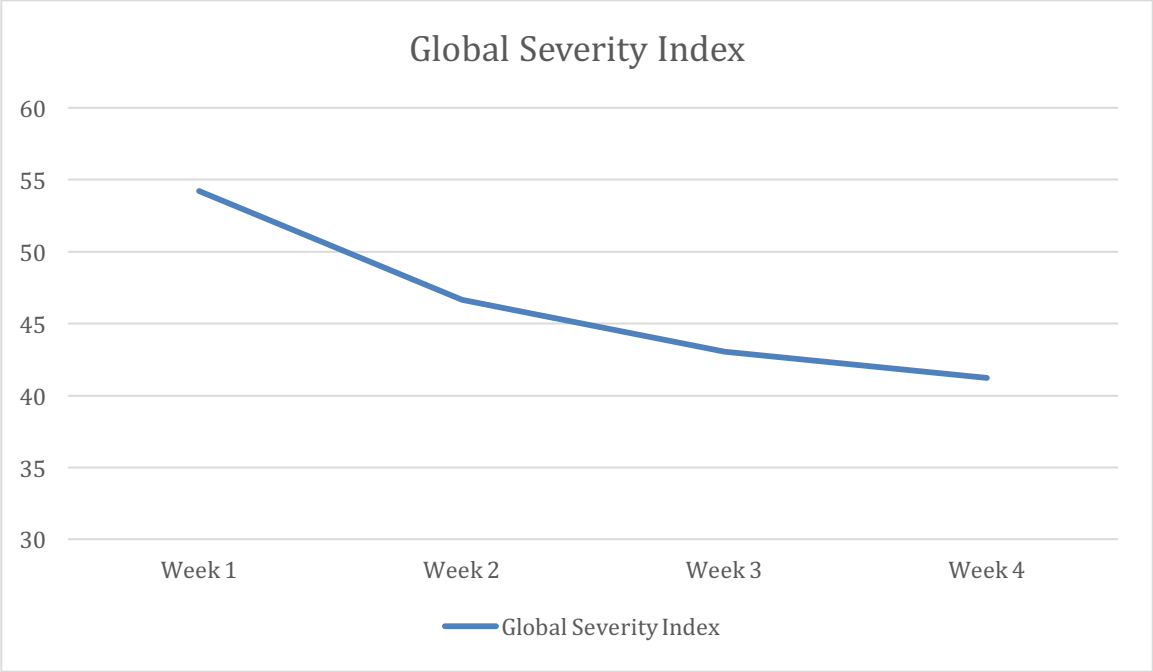
There was an overall significant effect for time, Wilks' Lambda=.34, F (3, 47)= 30.28, p= .000, partial eta squared = .66. This is considered a large effect. Post hoc tests using the Bonferroni correction revealed that the difference in the positive symptom total from Time 1 (53.48, ± 9.21) to Time 2 (46.42 ±8.74) was statistically significant (p=.000). The difference in the positive symptom total from Time 2 (46.42 ±8.74) to Time 3 (43.46, ±9.31) was also statistically significant (p=.000). The positive symptom total from Time 3 (43.46, ±9.31) to Time 4 (42.06, ±9.98) was *not* statistically significant (p=.107).

Global Severity Index

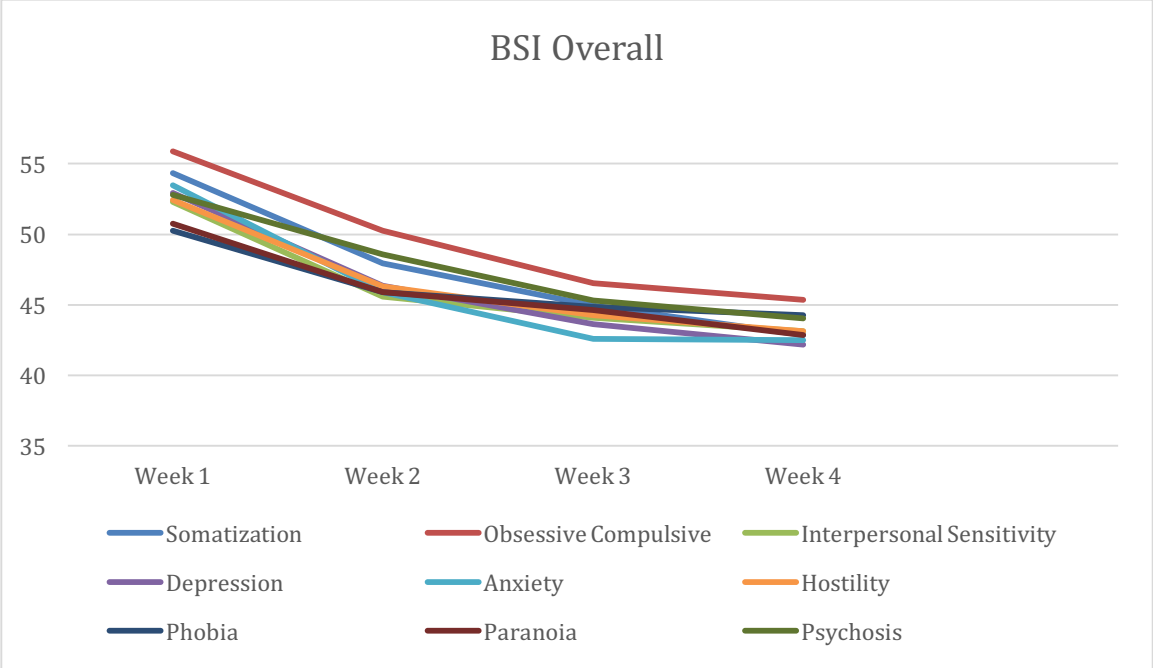
For the global severity index, if one endorsed no symptoms, their t-score would be 30; if they endorsed every symptom, their t-score would be 77.

A one way repeated measure ANOVA was conducted compare scores on the global severity index from Time 1, Time 2, Time 3 and Time 4. The means and standard deviations are presented in the table below:

Time Period	N	Mean	Standard Deviation
Week 1	50	54.20	8.56
Week 2	50	46.64	8.09
Week 3	50	43.04	8.44
Week 4	50	41.22	8.97



There was an overall significant effect for time, Wilks' Lambda=.22, F (3, 47)= 55.94, p= .000, partial eta squared = .78. This is considered a large effect. Post hoc tests using the Bonferroni correction revealed that the difference in the global severity index from Time 1 (54.20, ± 8.56) to Time 2 (46.64 ±8.09) was statistically significant (p=.000). The difference in the global severity index from Time 2 (46.64 ±8.09) to Time 3 (43.04, ±8.44) was also statistically significant (p=.000). The global severity index from Time 3 (43.04, ±8.44) to Time 4 (41.22, ±8.97) was also statistically significant (p=.02).



Discussion

As evidenced by the above statistical analysis, AToN residents had a consistent decrease in overall symptoms as measured by the Urge to Use Scale and the Brief Symptom Inventory.

Resident's Urge to Use decreased significantly between weeks 1-3 in particular. Additionally, these decreases were considered a large effect when reviewing the partial eta-squared (.69).

Every single scale on the Brief Symptom Inventory demonstrated a significant decrease in symptoms from week one to week two. Five scales significantly decreased between weeks one, two and three. Finally, two scales significantly decreased every single week; and these scales were overall scales. The largest effect sizes found in the BSI were in Global Severity Index (.78), Positive Symptom Distress Index (.73), Depression (.67) and Anxiety (.64). See the below charts for further information:

Statistically Significant in Weeks 1-4 with Partial Eta Squared
Global Severity Index (.78)
Positive Symptom Distress Index (.73)

Statistically Significant in Weeks 1-3 with Partial Eta Squared
Anxiety (.743)
Depression .(672)
Positive Symptom Total (.66)
Psychosis (.608)
Obsessive Compulsive (.59)

Statistically Significant in Weeks 1-2 with Partial Eta Squared
Somatization (.64)
Paranoia (.510)
Hostility (.519)
Interpersonal Sensitivity (.48)
Phobia (.385)

The preceding data demonstrates that residents who attend treatment at AToN Center can reasonably expect to experience a decrease in overall symptoms on a significant level. Additionally, symptoms of depression and anxiety tend to decrease the most.

Bibliography:

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