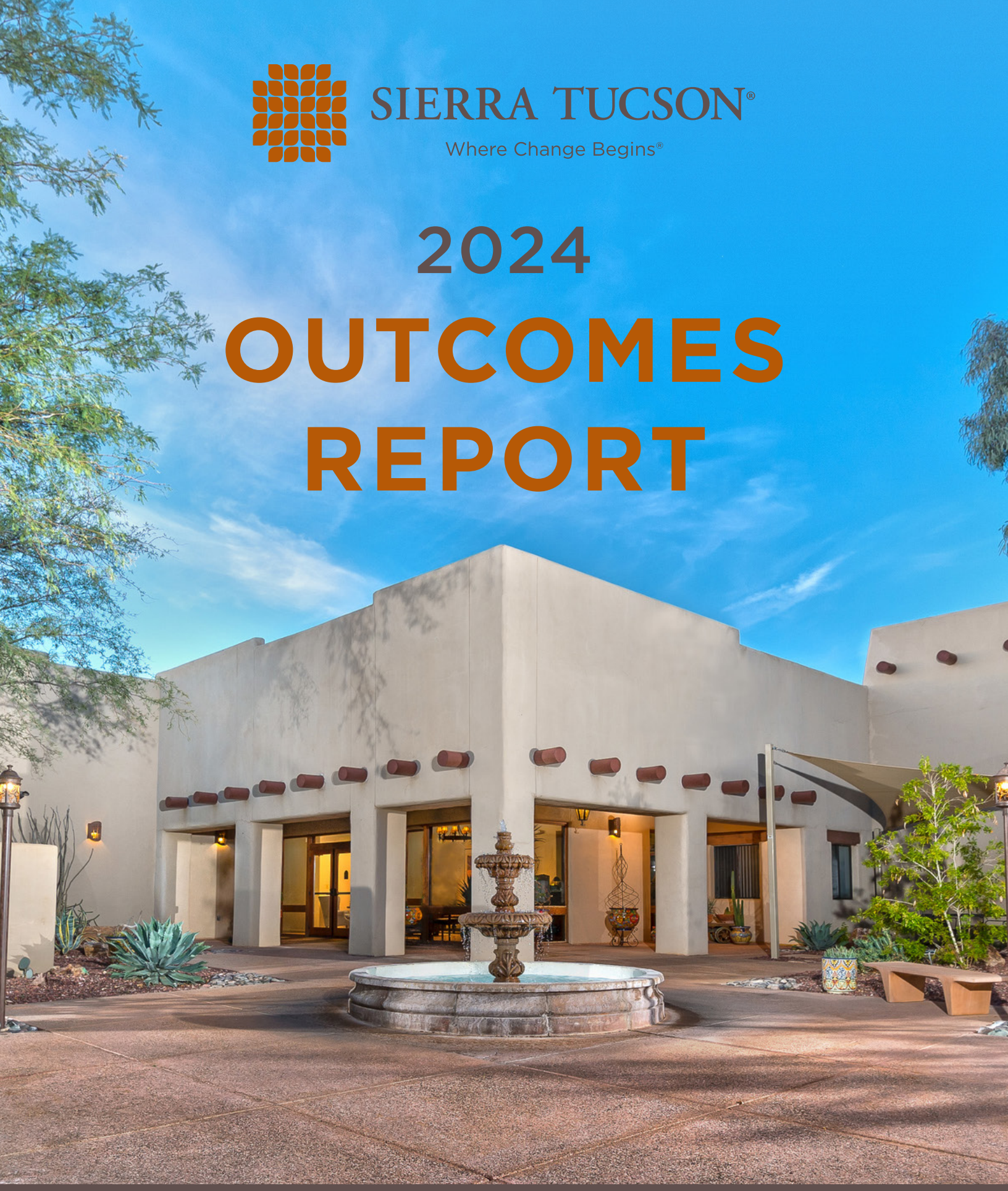
SIERRA TUCSON®

Where Change Begins®

2024 OUTCOMES REPORT



PREPARED BY

Alex Danvers, PhD, Director of Treatment Outcomes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INTRODUCTORY LETTER

When people are considering residential treatment for addiction or mental health—whether for themselves or a loved one—one of their first questions is "what's your success rate?"

Deciding to come to treatment for addiction or problems related to mental health is a big commitment. It can be intimidating. It requires you to put your daily life on hold while you devote your full attention to healing and growth. People want to know that if they make this commitment, they will benefit.

It's one thing to know that Sierra Tucson was rated the Best Addiction Treatment Center in Arizona in 2025. It's another thing to know exactly how treatment progresses at Sierra Tucson, and the kinds of changes people make in treatment.

That's where this Annual Outcomes Report comes in. As part of our commitment to excellence, Sierra Tucson collects information on changes in psychological functioning and symptom severity throughout each patient's stay. After they leave, we offer free Recovery Coaching for the next year through the Connect 365 Program. These two programs allow us to measure change while patients are in treatment and after they leave.

So what's our success rate? It turns out, that depends on what you are hoping to get out of treatment. Here are some ways this report can answer that (with a preview of some of our overall results).

- **Do you want to see changes in your feelings of depression, reducing sadness and increasing motivation?** Depression symptoms reduce by 49% on average while at Sierra Tucson, a large effect.
- **Do you want to see changes in symptoms of PTSD, like feeling often on edge and re-experiencing moments of trauma?** PTSD symptoms reduce by 45% on average while at Sierra Tucson, a large effect.
- **Do you want to feel less lonely and more satisfied with your life?** Ratings of loneliness decrease by 32% on average, and ratings of satisfaction with life increase by 46% on average while people are at Sierra Tucson.
- **Do you want to feel like your quality of life and strength of relationships has improved after you've left treatment?** That's a common outcome seen in the first year after treatment.
- **Do you want to stay sober and go to the hospital and emergency room less often?** That's a common outcomes seen in the first year after treatment.

To better understand the deep and multi-faceted recovery process at Sierra Tucson, I encourage you to read on. We're proud of the work we do here improving lives. We hope that when you see the evidence behind that work, you'll find that we can help the people you care about—and maybe even you.

Thank you,

Alex Danvers PhD

Alex Danvers, PhD, Director of Treatment Outcomes

WHAT'S NEW IN OUTCOMES

In 2024, the primary change to Sierra Tucson's Measurement Based Care Program was an update of the scales used. Our shift attempted to find shorter assessments for many of our key outcomes. With the saved time on these outcome measures, we were able to include new screening measures.

Our new screening measures are taken only once, at the start of treatment, and help us determine if there are mental health disorders that need to be evaluated more closely. These include measures of:

- ADHD
- Bipolar Disorder
- Eating Disorders

While a full diagnosis requires more evaluation, results on these measures can quickly clue in the care team to potential underlying issues. This can help with planning out care, and with determining whether more careful diagnostic work is needed for anything that came up.

Additionally, we added a measure of loneliness to our measures of broader psychological functioning. Loneliness is growing problem in the U.S., and has been described as "an epidemic." It is not uncommon for residents to start programming at Sierra Tucson feeling lonely and isolated. Connection is a fundamental human need, and not having it met can contribute substantially to psychological distress.

Measuring loneliness can help us understand what reduces it. **We believe that the community at Sierra Tucson can itself be healing. Residents have often praised the strong culture here.** Being among a supportive group that is working through similar issues together can reduce feelings of alienation and start to re-establish healthy communication.

THE MEASUREMENT-BASED CARE PROGRAM

The Sierra Tucson Measurement-Based Care (MBC) program is the primary way we collect outcomes for people while they're here, in residential treatment. In this program, residents complete a series of measures assessing their current level of symptoms and general psychological functioning. These measures are repeated every two weeks throughout treatment, to make sure that we're seeing improvements.

This is comprehensive, in that it gives information not just about how core symptoms of depression, anxiety, or PTSD are changing, but on broader measures of functioning. We ask how resilience, life satisfaction, and attachment styles are changing. These measures help us better understand the broader context for the individual.

The following measures are used in the Measurement-Based Care program.

Core Symptom Measures:

- **Depression:** Patient Health Questionnaire – 9 (PHQ9)
- **Anxiety:** Generalized Anxiety Disorder scale (GAD7)
- **PTSD:** PTSD Checklist for the DSM-V (PCL5)
- **Chronic Pain:** PROMIS Pain Interference – Short Form 6b (PROMIS Pain SF6b)
- **Insomnia:** Insomnia Severity Index (ISI)
- **Cravings:** Single-item ratings of specific substance cravings

Broader Psychological Functioning Measures:

- **Life Satisfaction:** Satisfaction with Life Scale (SWLS)
- **Loneliness:** UCLA 3-item Loneliness Screener (Hughes et al., 2004)
- **Resilience:** Brief Resilience Scale (BRS)
- **Attachment Style:** Experience in Close Relationships – Relationship Structures (ECR-RS)
- **Coping Style:** Sierra Tucson Confidence in Coping Styles (comparable to Coping Self-Efficacy)
- **Meaning in Life:** Sierra Tucson Existential Beliefs Scale

Screening Measures at Baseline:

- **ADHD:** Adult ADHD Self-Report Scale (ASRS-v1.1)
- **Bipolar Disorder:** Mood Disorder Questionnaire (MDQ)
- **Eating Disorders:** SCOFF Eating Disorder Screener (SCOFF)
- **Childhood Trauma:** Adverse Childhood Events – International Questionnaire (ACE-IQ)
- **Aggression:** Buss-Perry Aggression Questionnaire – Short Form (BPAQ-SF)

CLINICAL INTEGRATION

We don't just measure mental health treatment outcomes because it's interesting. We do it to learn more about what's working and how to continually improve our care.

As soon as a resident completes their Measurement-Based Care evaluation, results of their test are scored and turned into reports for residents and care providers—both their primary therapist and their medical provider. The care providers use this information in planning treatment for the resident.

The resident gets a copy of the results, and reviews it with a member of the Measurement Based Care staff, because we want to include our residents in the process of planning out their care.

Looking at data about your own symptoms shouldn't be entirely surprising—after all, you're answering the questions. Yet we find that it can often create space to reflect on what is going on. It can offer validation of a complaint that you might have doubted, or not felt was legitimate. It can also reveal strengths, perhaps in areas of psychological functioning that you had not considered closely.

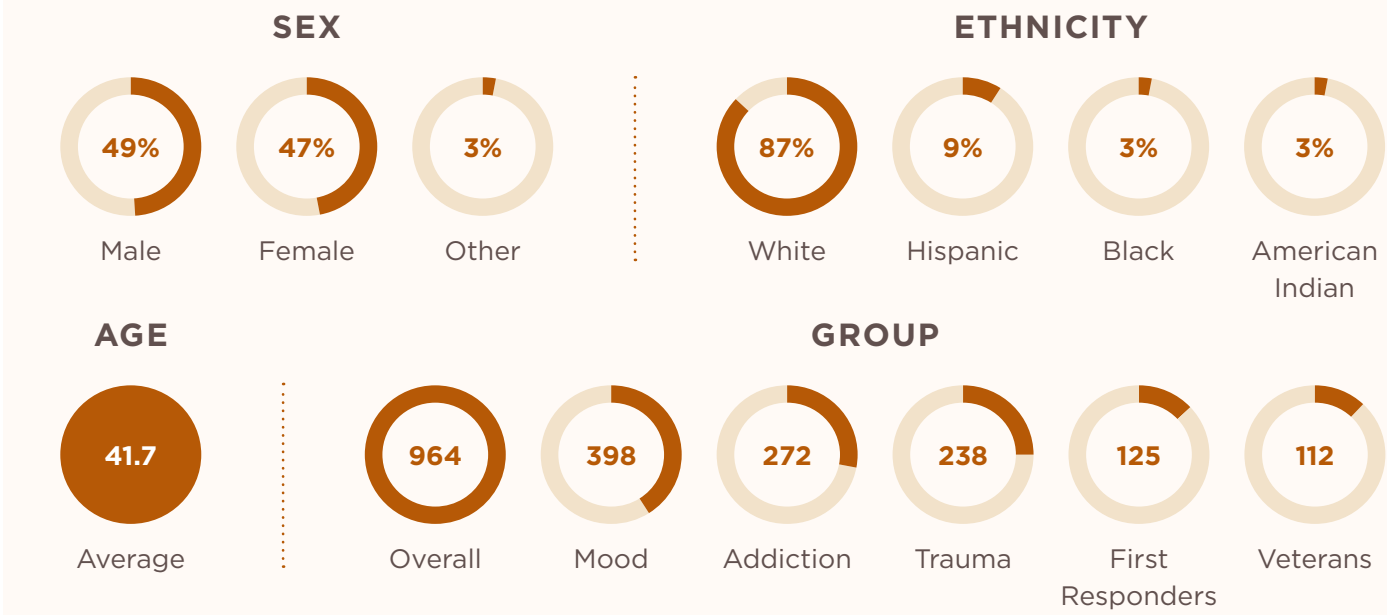
Assessments are provided every two weeks throughout a person's stay, meaning this information can also be used to see how treatment is going. If the steps being taken aren't leading to the kind of improvement our treatment team would like to see, we can reassess if what we're doing is working. Since Sierra Tucson has such a broad array of experts and modalities, we can usually find some way to pivot into to another effective treatment approach.

In 2025, we have begun a program that helps us focus our efforts on people whose treatment isn't progress as fast as we want. We call this the Recovery Opportunity Cohort. When we review assessments for someone who has been at Sierra Tucson two or more weeks, we check each one to see if they are continuing to have high symptom levels. If they are not improving quickly enough, we alert the treatment team and the clinical and medical leadership that we need to pay special attention to what we're doing with the individual. It may be that we are on a steady course to improve. But sometimes this can trigger the decision to change an element of care so that we can see better and more rapid recovery.

PATIENT PROFILES

Who comes to Sierra Tucson? Although our facility gained prominence for treating addiction and substance use disorder, we have expanded and improved our services to help people with a number of mental health issues. This includes mood disorders like depression and anxiety, and trauma recovery.

In 2024, we collected outcomes data on 964 people. Some brief demographics:



Note that other race/ethnicity categories were assessed, but none other had more than 2% of the population, so they were omitted from the chart.

In 2024 we also collected long term follow-up data on residents who have left our program. This data was collected through the Connect 365 recovery coaching program offered to all alumni of Sierra Tucson residential treatment.

The following demographic details were collected on residents who participated in the follow-up surveys through Connect 365:

- Data was collected on 167 alumni.
- Average age was 44 (youngest was 19, oldest was 71)
- 51% were Male, 47% were Female, 2% identified as non-binary or other

TREATMENT OUTCOMES AT RESIDENTIAL

In this section, we provide treatment outcomes for individuals while at Sierra Tucson's residential care facility. We divide these outcomes into three groups:

- Core Symptom Change
- Broader Psychological Functioning Change
- Substance Cravings Change

We also create some other groupings to examine our results:

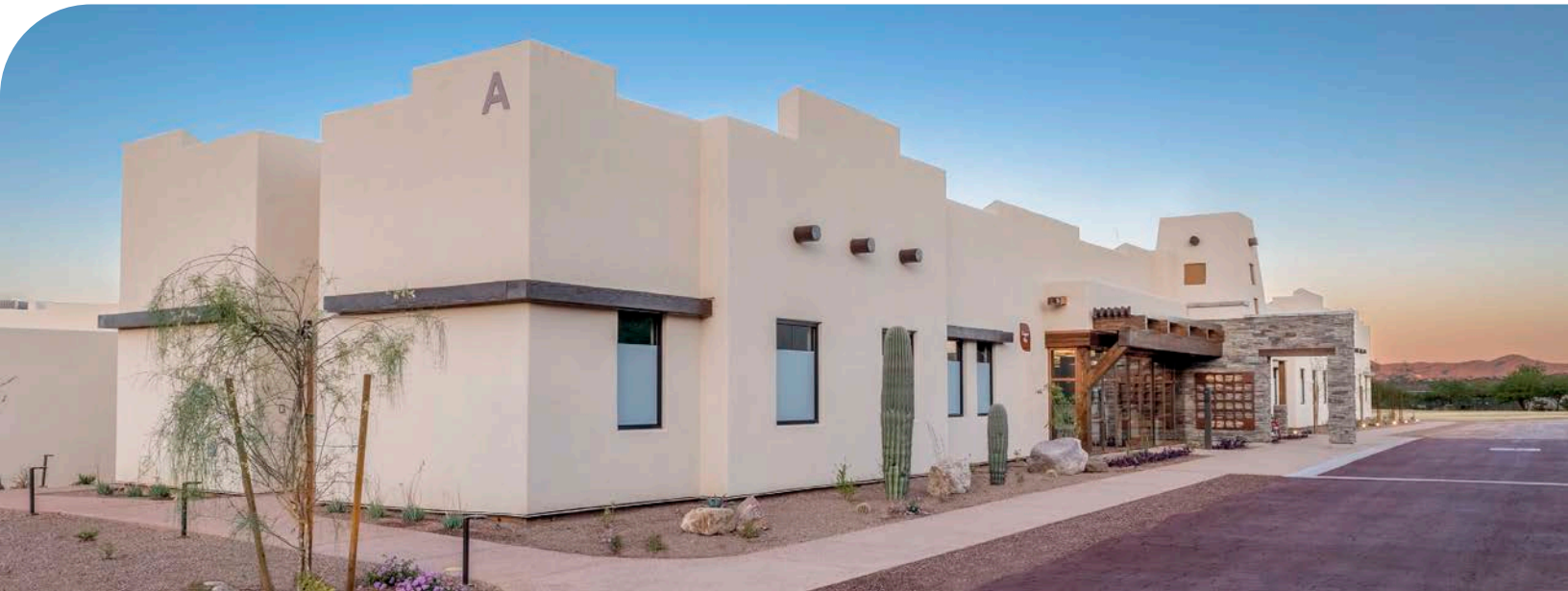
- **Overall:** All residents
- **Program:** Outcomes broken down by our three primary programs (Addiction, Mood, and Trauma Recovery)
- **Red, White, and Blue:** Outcomes specific to First Responders and U.S. Military Veterans, who participate in our Red, White, and Blue Program

These outcomes are summarized in the following graphics. All measures were rescaled to run from 0 to 100. This is called a Percentage of Maximum Possible, or POMP, score. It allows for easy comparison of many different psychological scales, which can have different numbers of questions and different ratings scales (e.g., four options, five options, seven options for response).

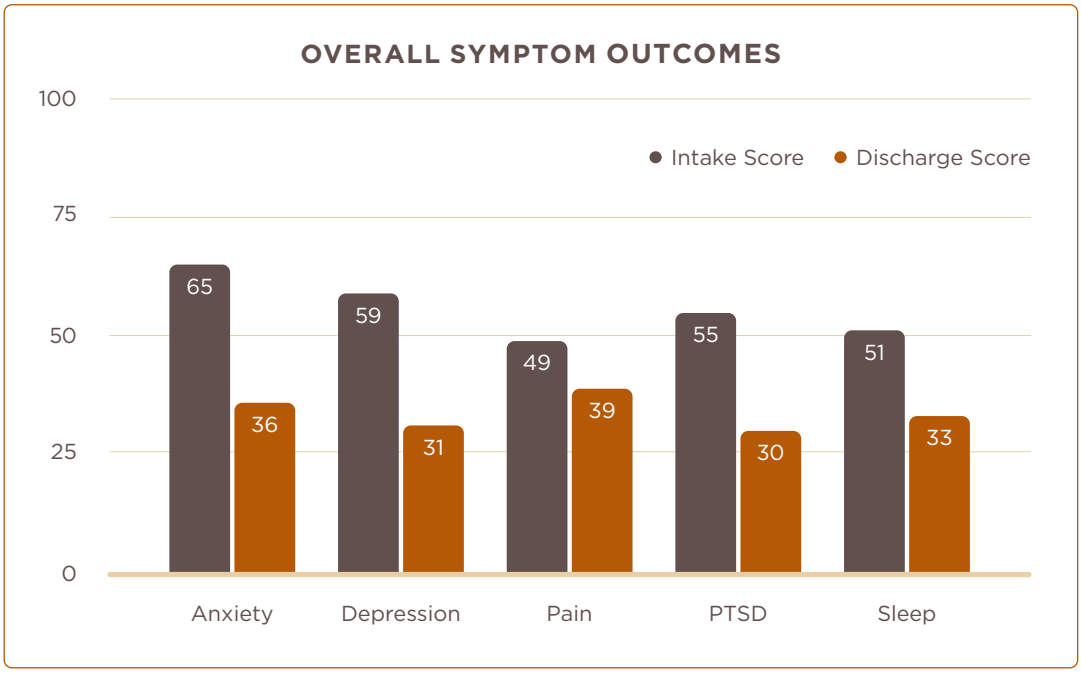
CHANGE IN SYMPTOM SCORES

The following data indicates that overall, there were statistically significant decreases in all of the symptoms measured.

- Depression reduced by 49% on average
- PTSD symptoms reduced by 45% on average
- Anxiety reduced by 45% on average

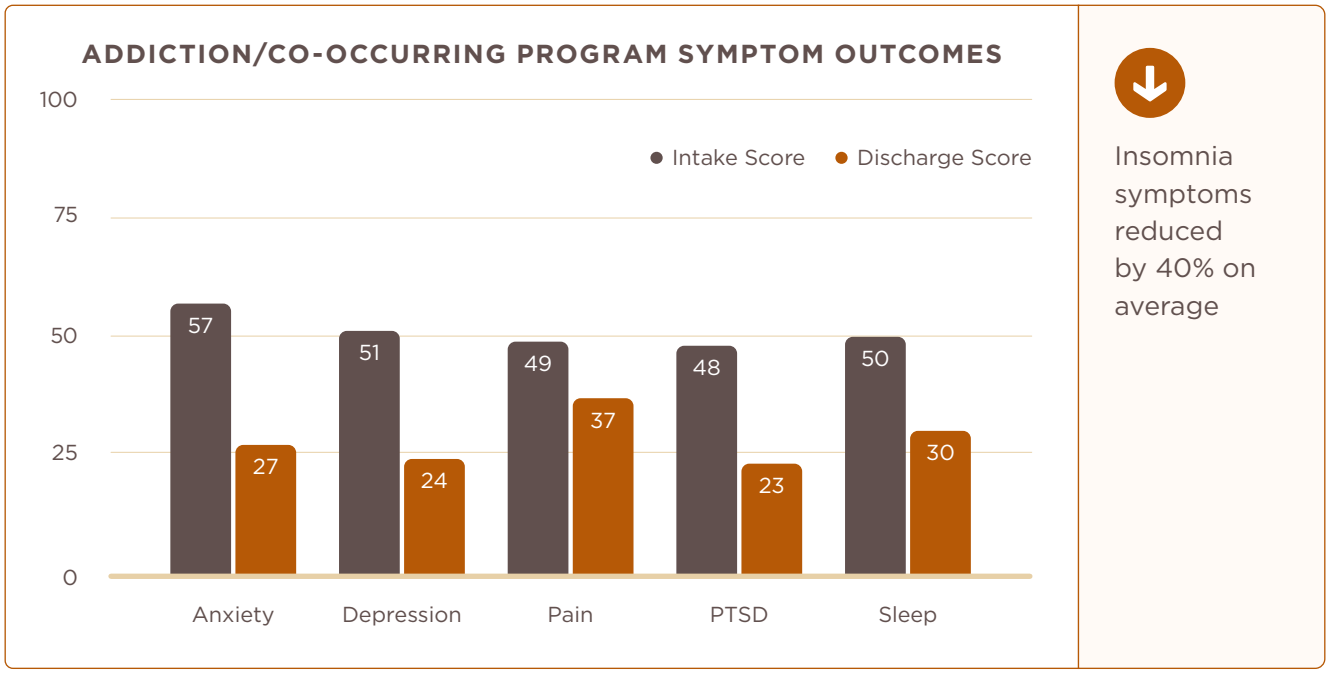


CHANGE IN SYMPTOM SCORES (CONT.)

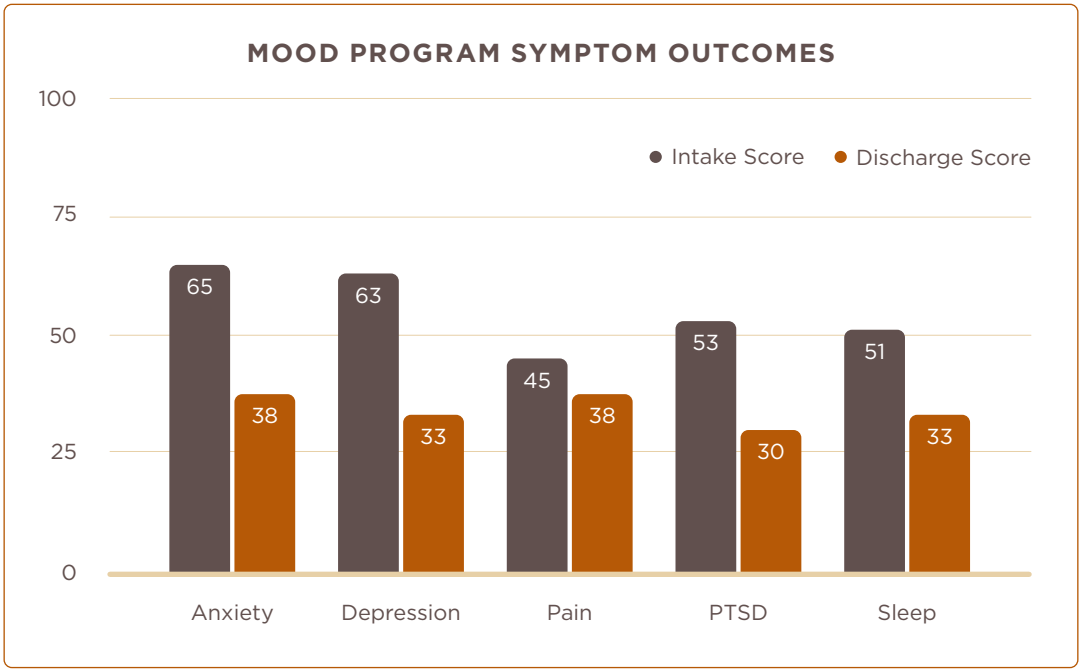


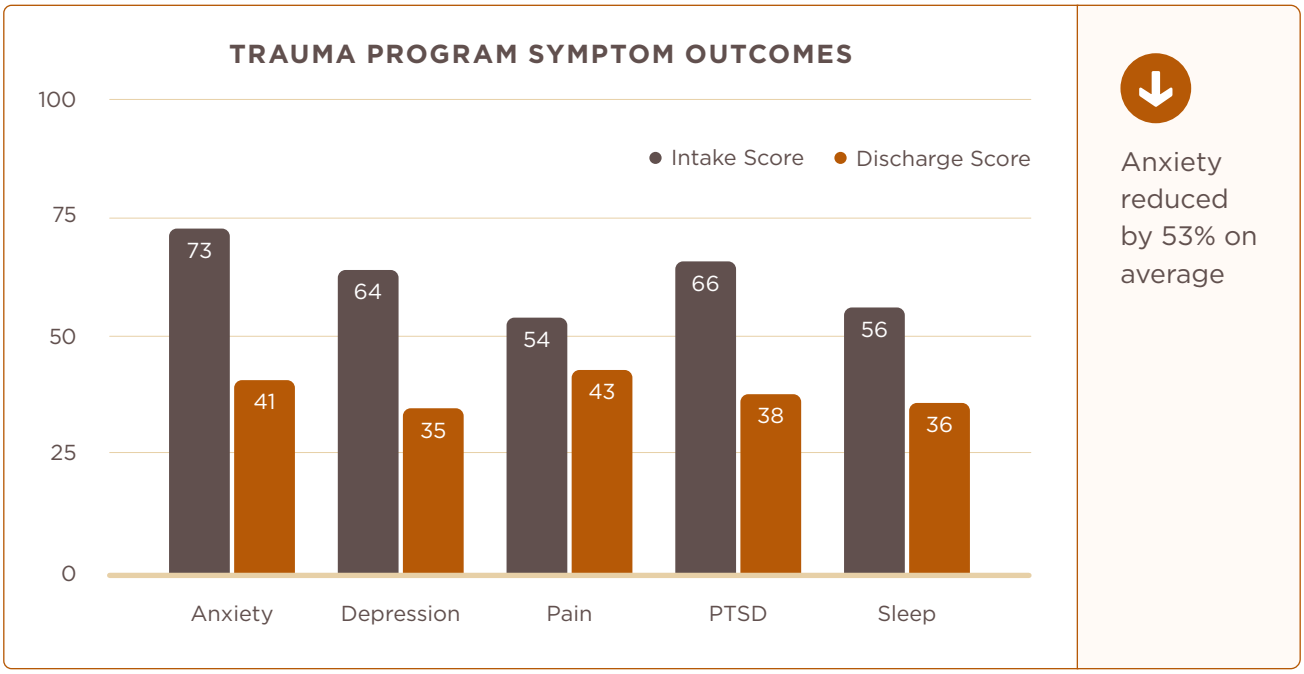
CHANGES BY PROGRAM

The following data shows differences in changes based on an individual's primary program. Again, there were statistically significant reductions in all symptoms for all groups.



Insomnia symptoms reduced by 40% on average





Anxiety reduced by 53% on average

A couple of differences between programs stand out:

- Chronic pain was reduced more in the Addiction and Trauma Recovery programs than in the Mood program.
- Sleep problems were reduced more in the Addiction program than in the Mood and Trauma Recovery programs.

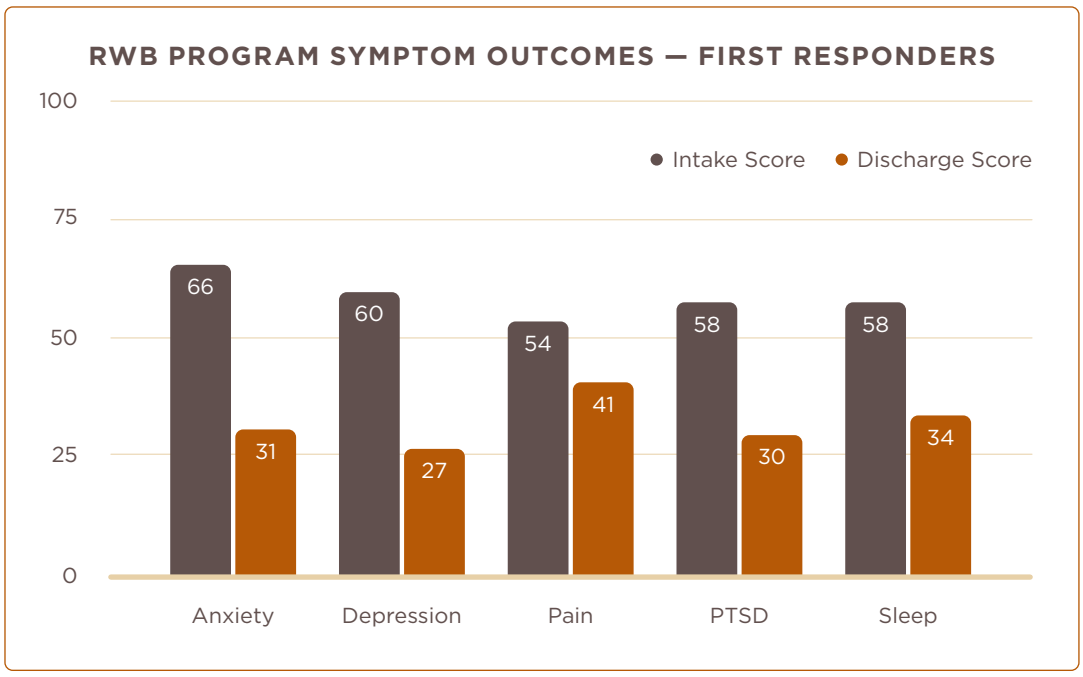
RED, WHITE, AND BLUE PROGRAM CHANGES

The following data shows differences in changes for first responders and veterans. Again, there were statistically significant reductions in all symptoms for all groups.

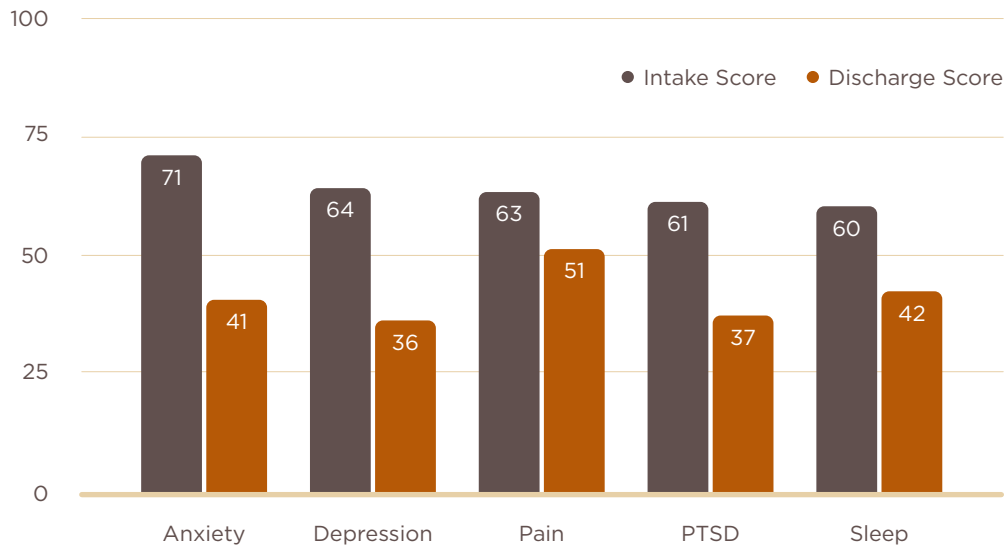
The broad trend is that first responders tend to have especially large improvements from treatment (especially for depression, anxiety, and sleep problems), while veterans tend to have smaller improvements from treatment.

In general, treating veterans can be difficult—they are often dealing with significant stress from their service, and may find it difficult to reconnect with civilians who have had very different expectations and life experience. Overall, our results for this group are good when compared to overall outcomes for many other clinics. However, this data is a reminder that veterans often face significant difficulties, and need care designed to help address the specific situations they have faced.

- PTSD reduced by 48% on average in First Responders
- Depression reduced by 55% on average in First Responders
- Anxiety reduced by 53% on average in First Responders



RWB PROGRAM SYMPTOM OUTCOMES — VETERANS



PTSD reduced by 39% on average in U.S. Military Veterans

Depression reduced by 44% on average in U.S. Military Veterans

Anxiety reduced by 42% on average in U.S. Military Veterans

CHANGES IN BROADER PSYCHOLOGICAL FUNCTIONING

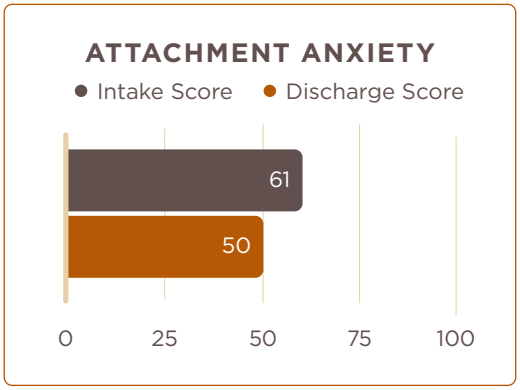
The following section looks at outcome measures not directly related to a disorder. No one gets "diagnosed" with not having good coping skills or not feeling resilient—but these are important indicators of overall functioning. **Good treatment doesn't just make symptoms go away—it makes people feel like they are positively and meaningfully engaged with their lives.**

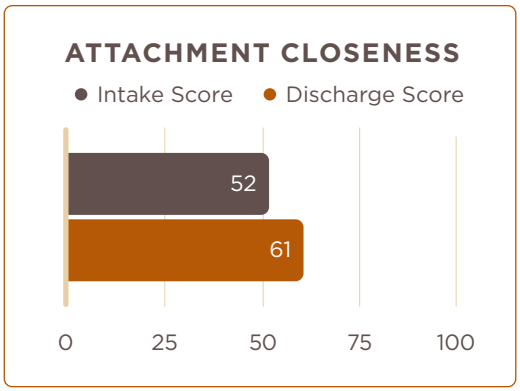
OVERALL CHANGES

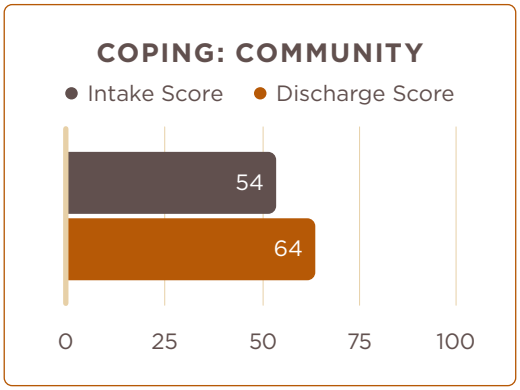
From the following data, we can see that there were statistically significant improvements in all of the broader psychological functions measured. By the effect size measure, the biggest improvements were seen in an increase in feeling able to cope with emotions, a decrease in feeling lonely, and an increase in satisfaction with life.

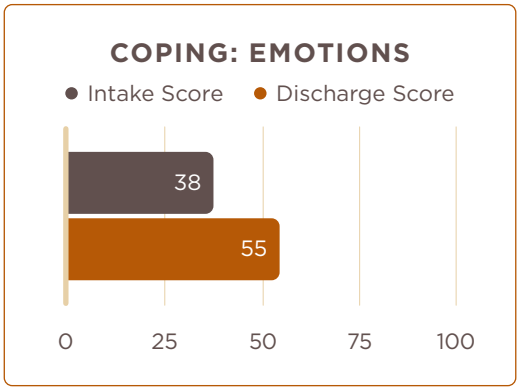
It's also worth noting that small-to-medium effect size changes were seen in our two measures of adult attachment style. People had less attachment anxiety in their close relationships, meaning less concern about not getting the care and attention they need. They also had more closeness, meaning they felt more able to rely on close others for help—and they had less avoidance of intimacy. While attachment style is generally thought to come from early childhood experiences, newer research suggests that corrective experiences—like those of a therapist with a client—can help change the internal working model of close relationships that people carry around with them. Staying in residential treatment at Sierra Tucson creates a moderate shift in these patterns.

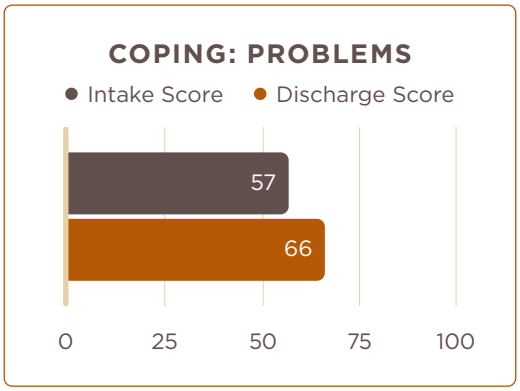
- Coping with Emotions increased by 47% on average
- Loneliness reduced by 32% on average
- Satisfaction with Life increased by 46%

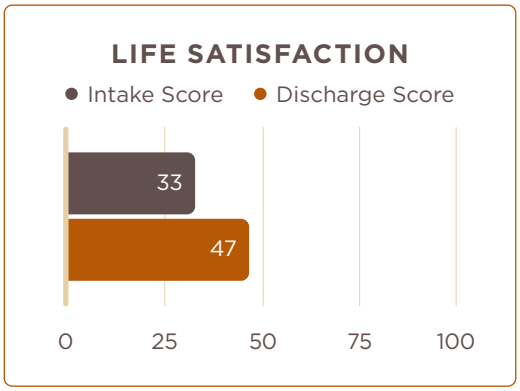

ATTACHMENT ANXIETY
Intake Score
Discharge Score
61
50
0
25
50
75
100

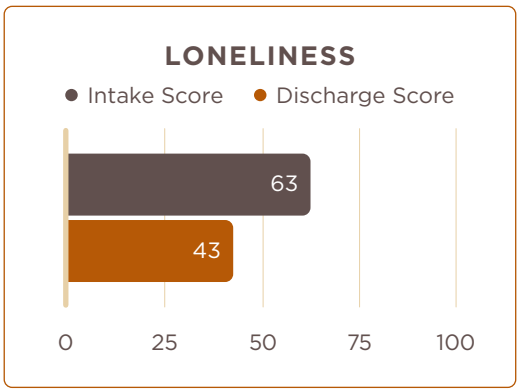

ATTACHMENT CLOSENESS
Intake Score
Discharge Score
52
61
0
25
50
75
100

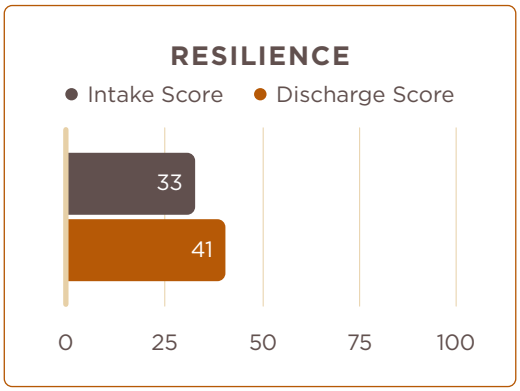

COPING: COMMUNITY
Intake Score
Discharge Score
54
64
0
25
50
75
100


COPING: EMOTIONS
Intake Score
Discharge Score
38
55
0
25
50
75
100


COPING: PROBLEMS
Intake Score
Discharge Score
57
66
0
25
50
75
100


LIFE SATISFACTION
Intake Score
Discharge Score
33
47
0
25
50
75
100


LONELINESS
Intake Score
Discharge Score
63
43
0
25
50
75
100


RESILIENCE
Intake Score
Discharge Score
33
41
0
25
50
75
100

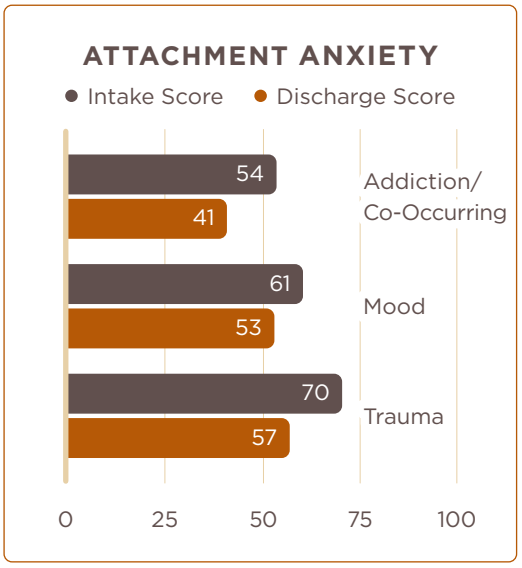
CHANGES BY PROGRAM

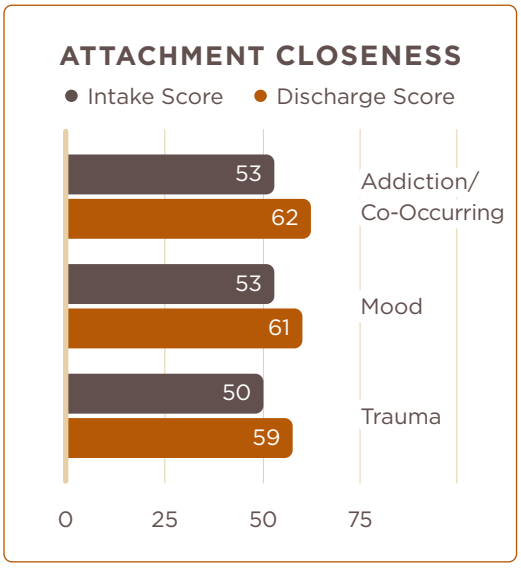
There were statistically significant improvements in all of the broader psychological functions measured in each program. The data below provides separate tests for those people in each program.

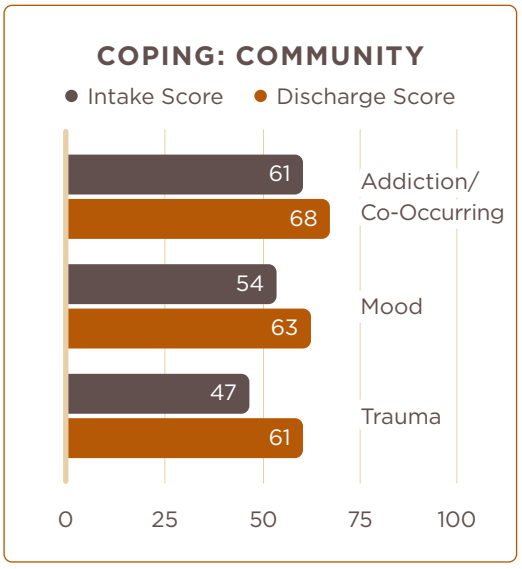
For the Addiction Recovery program Loneliness reduced by 41% on average

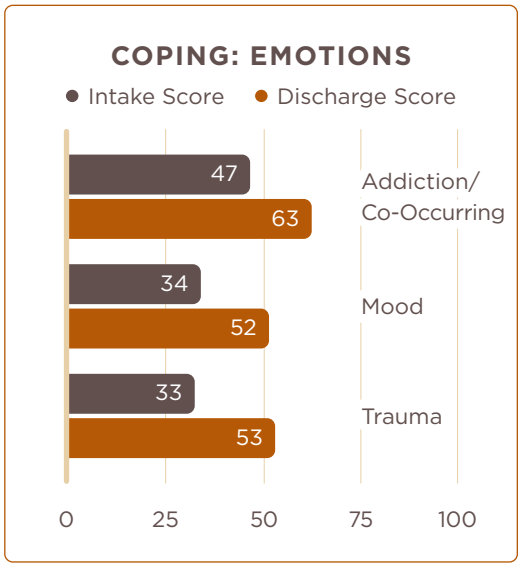
For the Mood Recovery program Resilience increased by 34% on average

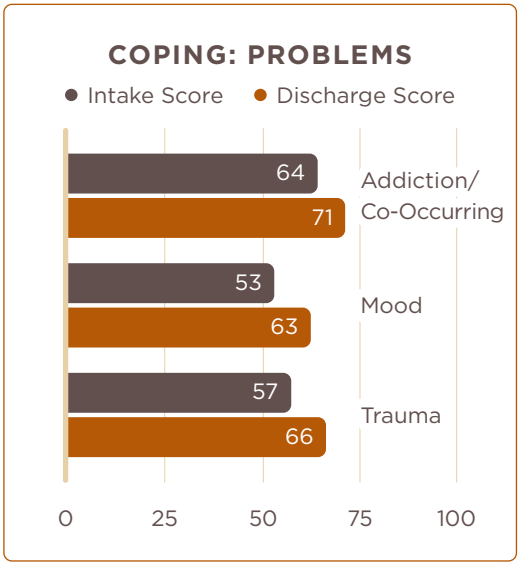
For the Trauma Recovery program Coping through Community increased by 30% on average

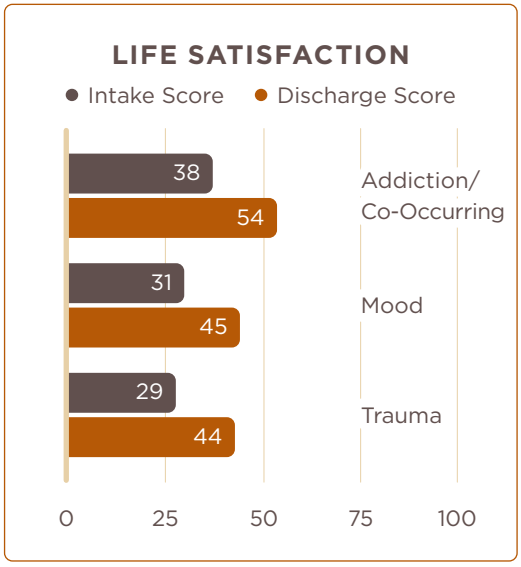


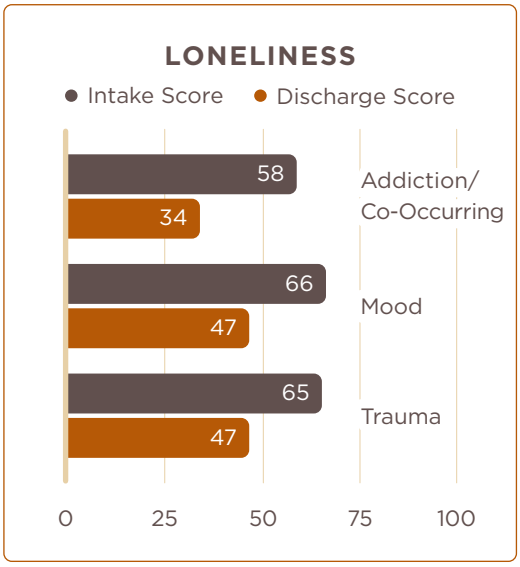


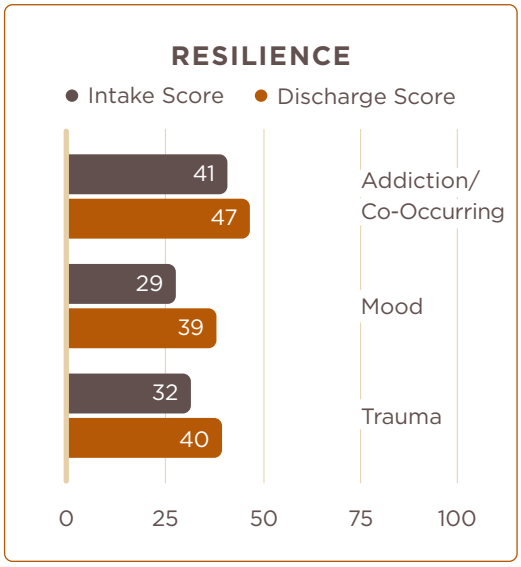










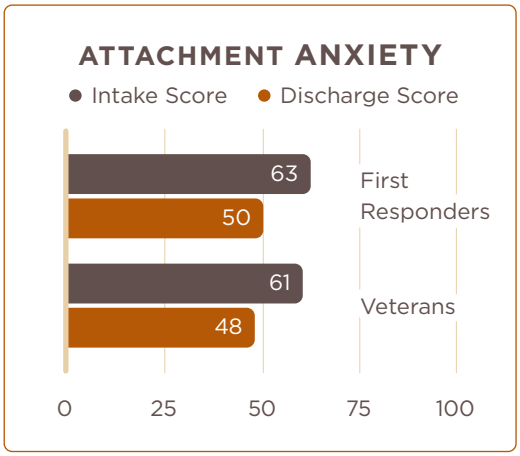


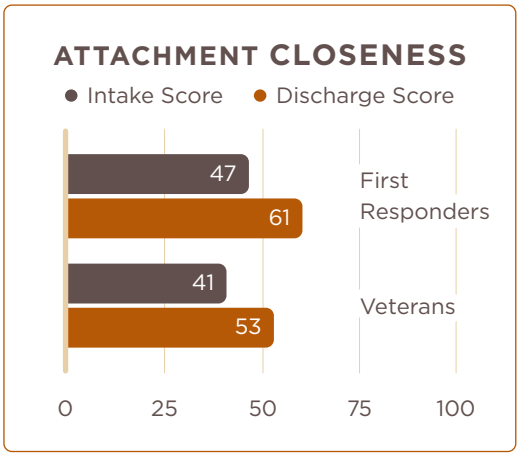
There were a few places where some programs stood out from others in their effect sizes:

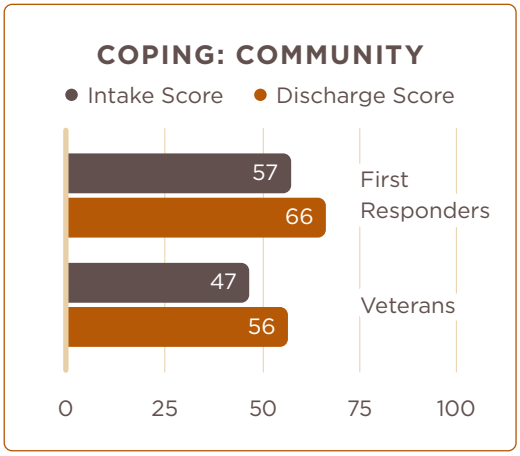
- The Addiction and Trauma Recovery programs were better at reducing attachment anxiety.
- The Trauma Recovery program was particularly good at increasing people's ability to Cope through Community.
- The Trauma Recovery program was particularly good an increasing people's ability to Cope with Emotions.
- The Addiction Recovery program was particularly good at increasing people's satisfaction with life.
- The Addiction Recovery program was particularly good at reducing people's feelings of loneliness.

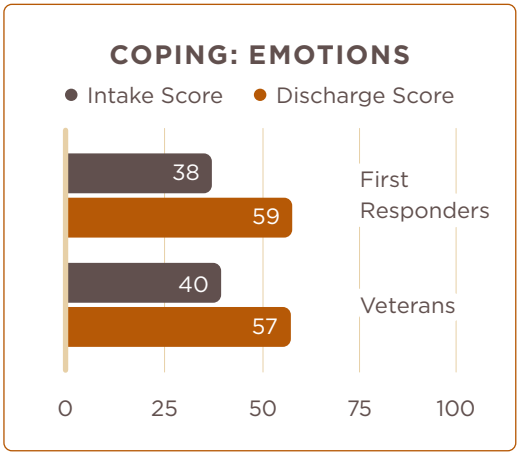
RED, WHITE, AND BLUE PROGRAM CHANGES

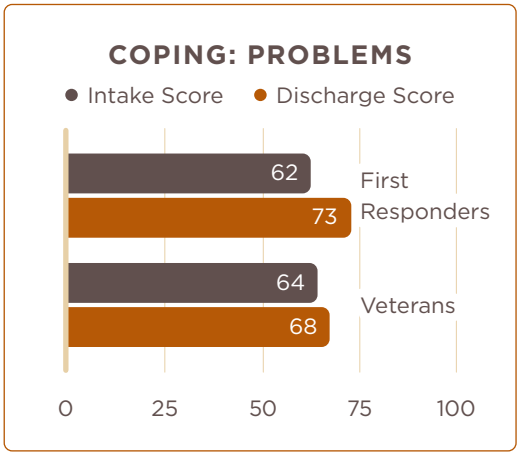
The following data shows differences in changes for first responders and veterans. There were statistically significant improvements in most measures. These were cases where veterans showed smaller effect sizes for Coping with Problems and Resilience. The smaller changes may reflect more complex cases (as noted previously, veterans often have a lot to sort through), and that veterans didn't have large deficits in these areas when entering treatment.

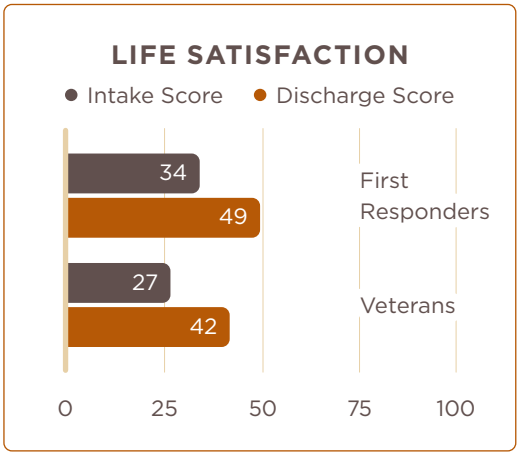


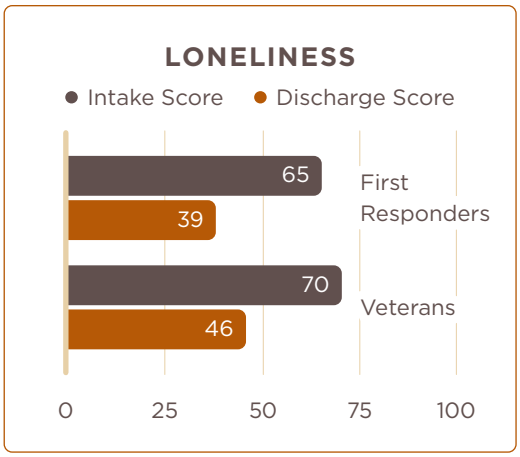


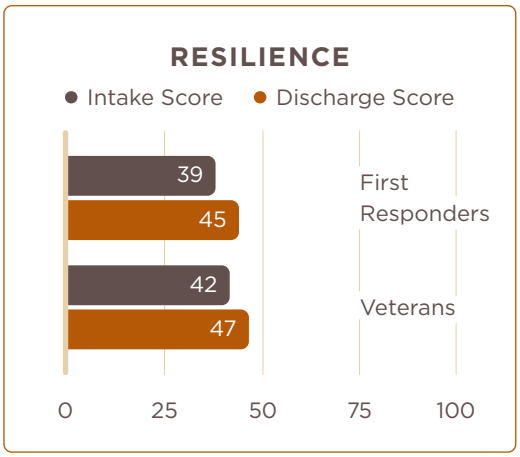












The strongest effect for both groups was a reduction in loneliness, reflecting Sierra Tucson's emphasis on building a strong community around recovery.

CHANGES IN CRAVINGS FOR SUBSTANCES

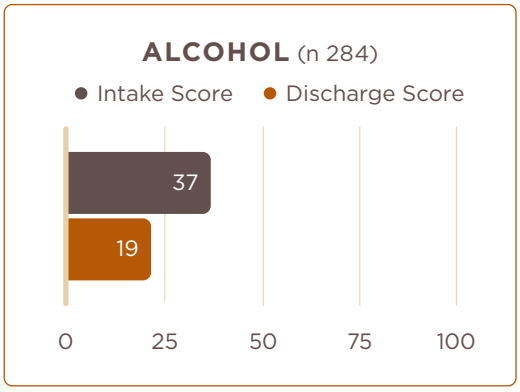
In the following data, changes in cravings for specific substances throughout treatment are provided. Note that “n” stands for “number of people,” and gives the number of people who entered treatment with some level of craving for each substance. In cases where only few people have been treated, statistical significance is less likely, because we can’t say with as much confidence what would happen in treatment “in general.”

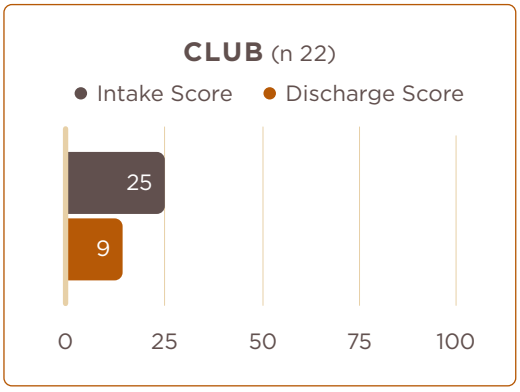
OVERALL CRAVINGS CHANGE

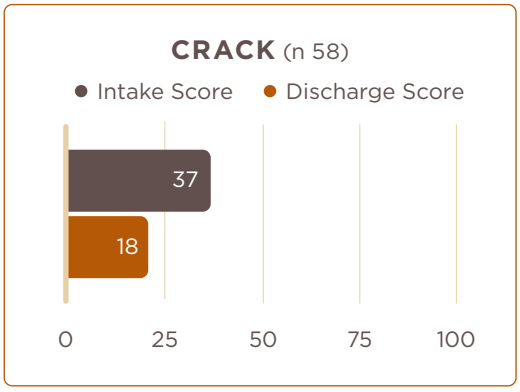
There were statistically significant reductions in cravings for all substances, except inhalants. This is because cravings for inhalants were relatively rare; among those who did have them a decrease was observed.

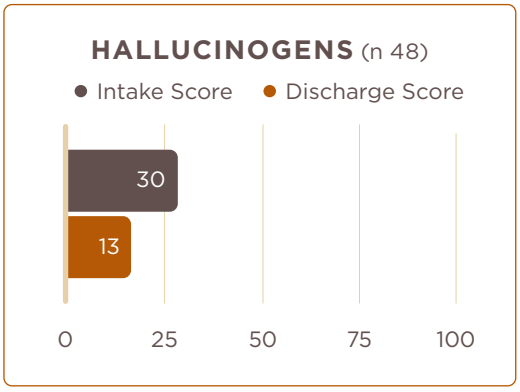
Large reductions in cravings, by our effect size measure, were seen for the following:

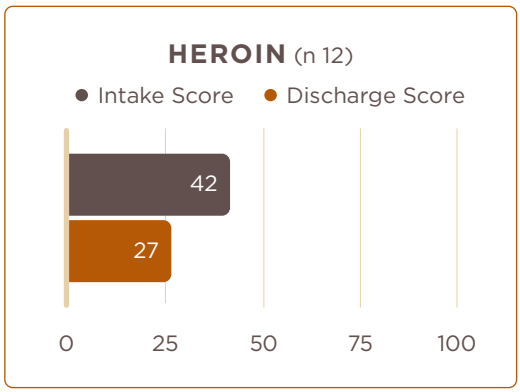
- Sedatives
- Stimulants
- Painkillers
- Alcohol
- Hallucinogens

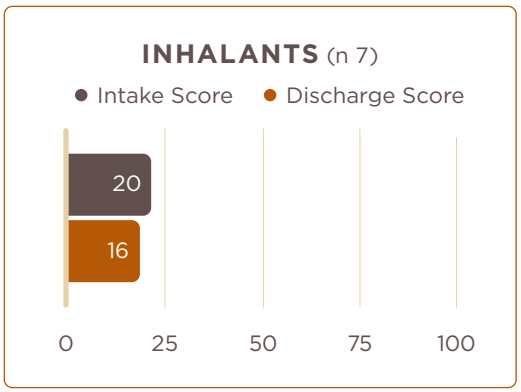


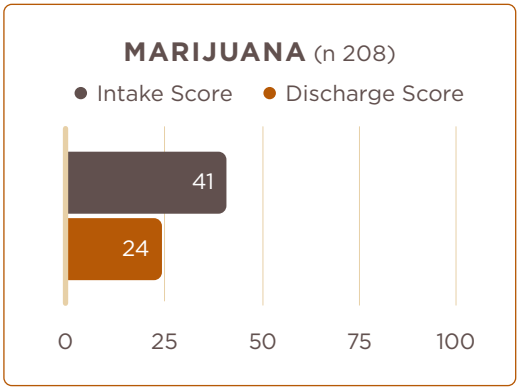


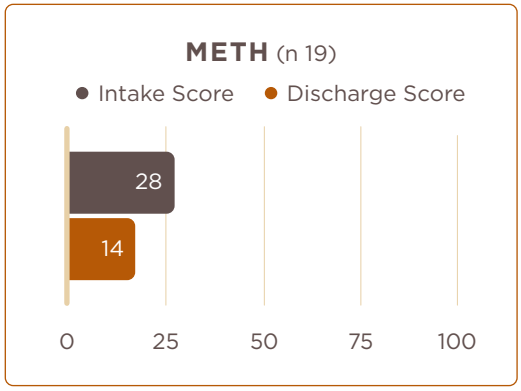


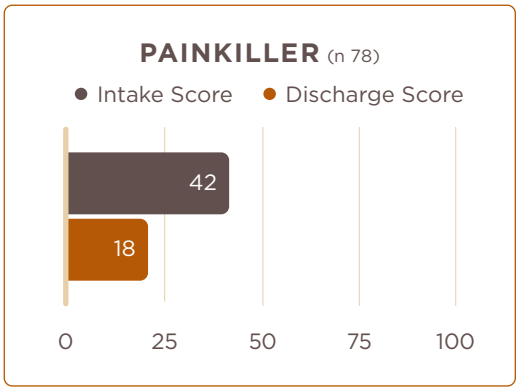


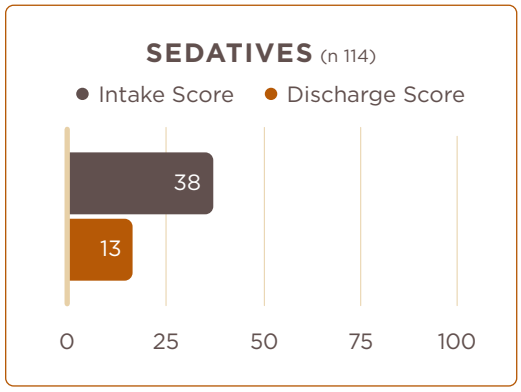

HEROIN (n 12)
Intake Score
Discharge Score
42
27
0
25
50
75
100

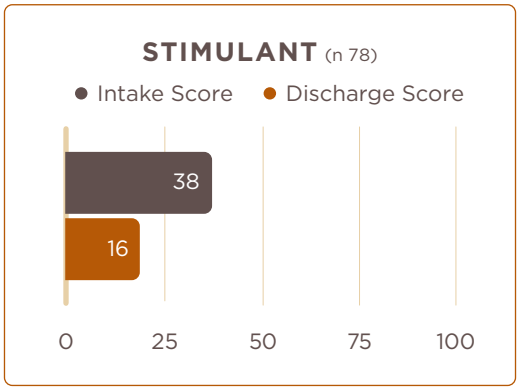

INHALANTS (n 7)
Intake Score
Discharge Score
20
16
0
25
50
75
100


MARIJUANA (n 208)
Intake Score
Discharge Score
41
24
0
25
50
75
100


METH (n 19)
Intake Score
Discharge Score
28
14
0
25
50
75
100


PAINKILLER (n 78)
Intake Score
Discharge Score
42
18
0
25
50
75
100


SEDATIVES (n 114)
Intake Score
Discharge Score
38
13
0
25
50
75
100

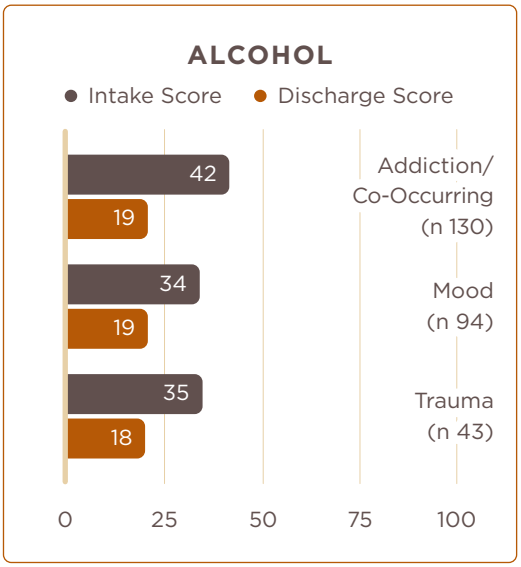

STIMULANT (n 78)
Intake Score
Discharge Score
38
16
0
25
50
75
100

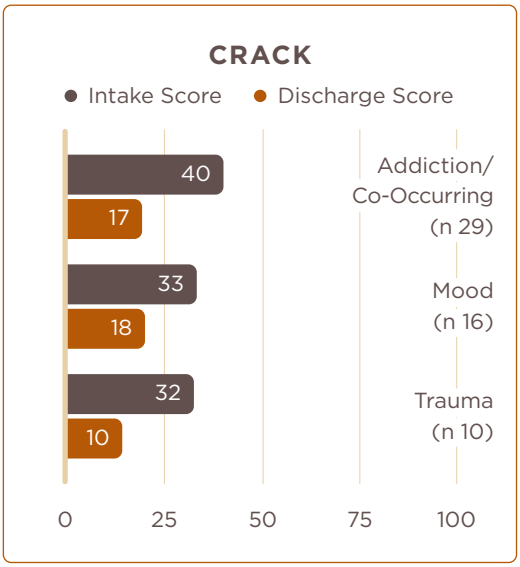
CRAVINGS CHANGE BY PROGRAM

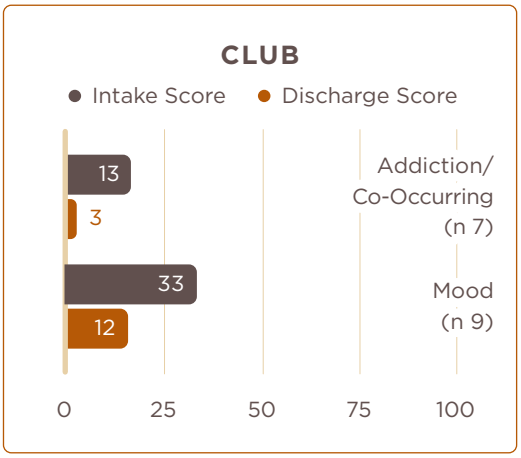
In the following data, changes in craving are divided out by program. In cases where five or fewer people had a craving, no statistic was calculated. This is why some combinations of program and substance aren't present: there weren't enough people treated with cravings for that substance in that program to get reliable statistics.

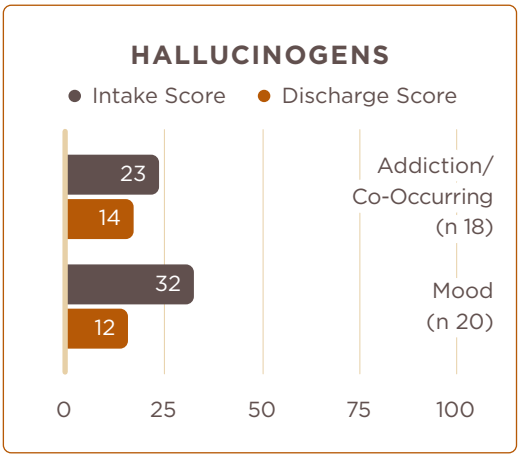
Based on our effect size measure, the following craving reductions had a large effect size:

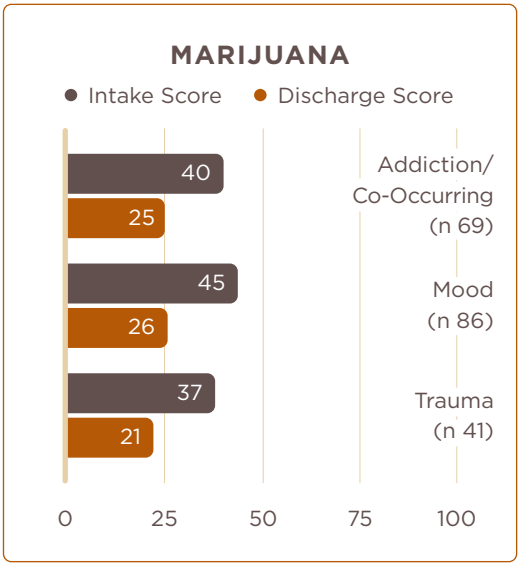
- Club drugs (e.g., MDMA) in the Addiction Recovery program.
- Sedatives in all programs, but especially the Trauma Recovery program.
- Stimulants in all programs, but especially the Trauma Recovery program.
- Painkillers in all programs, but especially the Trauma Recovery program.
- Hallucinogens in the Mood Recovery program.
- Crack in the Addiction and Trauma Recovery programs.
- Alcohol in the Addiction and Trauma Recovery programs.

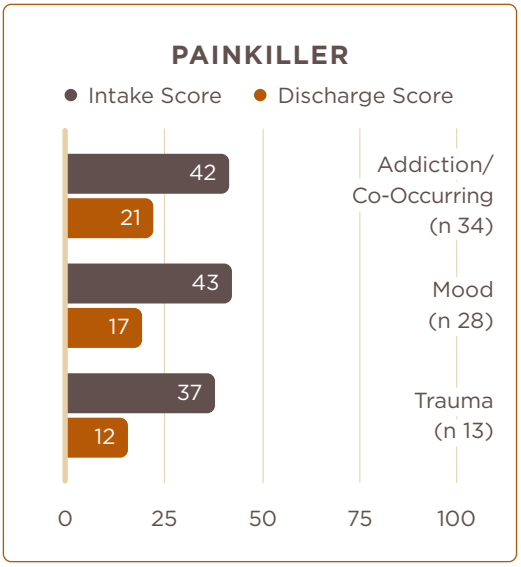


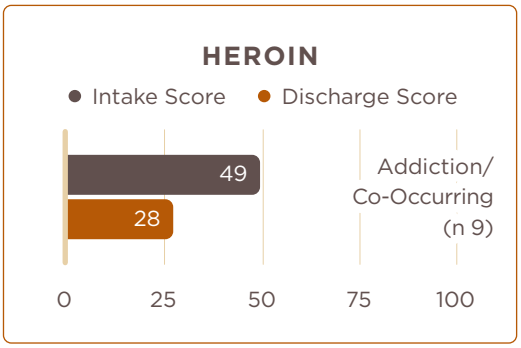


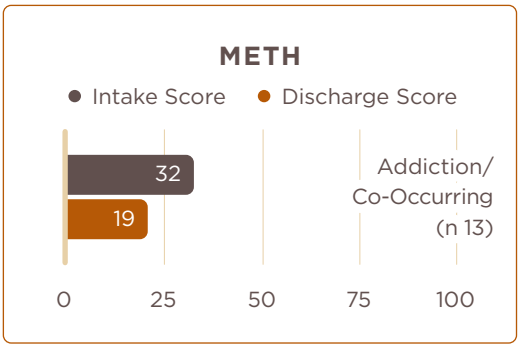


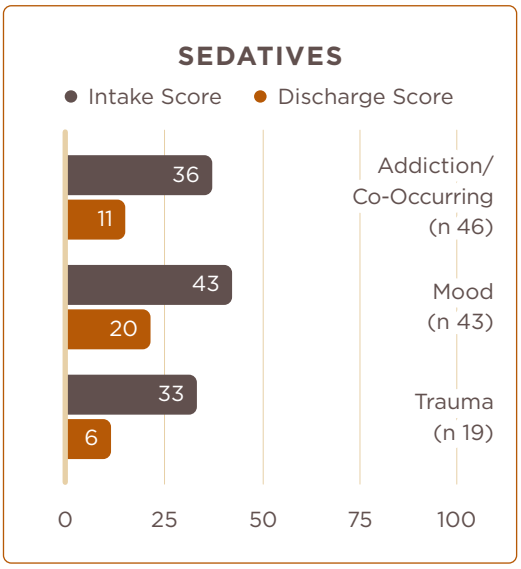


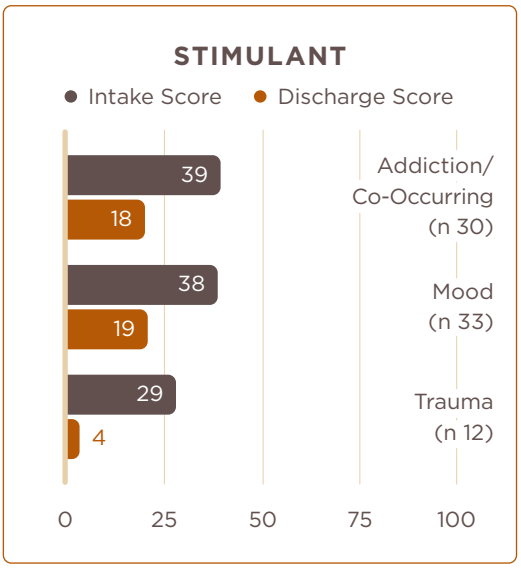








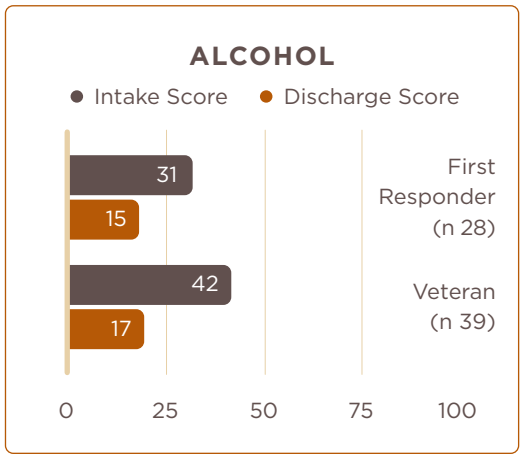


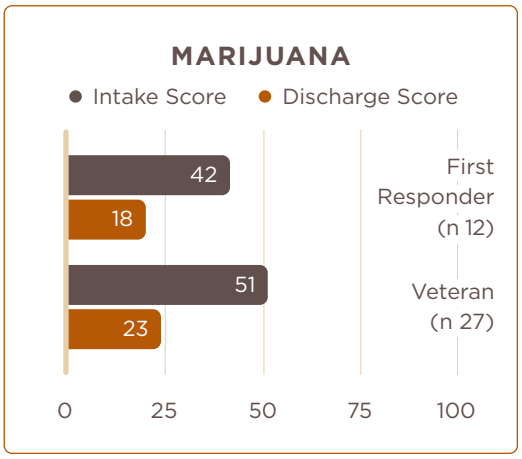


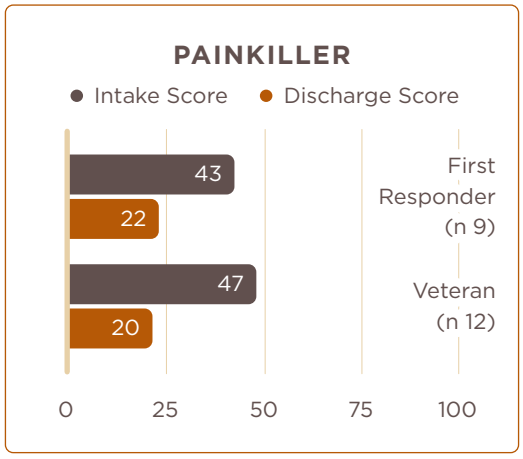
It's worth noting that the Trauma Recovery program is so helpful in reducing cravings for sedatives, stimulants, and painkillers. Many clinicians and researchers believe that underlying substance use disorder is unresolved trauma. Our clinical outcomes provide some evidence in favor of this theory. Working through trauma appears to also help reduce feeling the need for substances.

RED, WHITE, AND BLUE CRAVINGS CHANGE

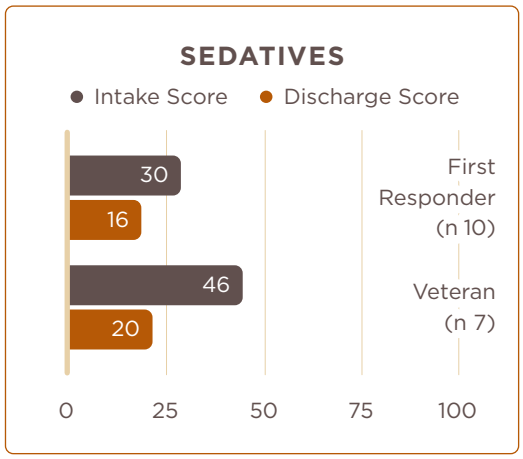
In the following data, changes in craving are divided out by veterans and first responders. In cases where five or fewer people had a craving, no statistic was calculated. This is why some combinations of population and substance aren't present: there weren't enough people treated with cravings for that substance in that population to get reliable statistics.

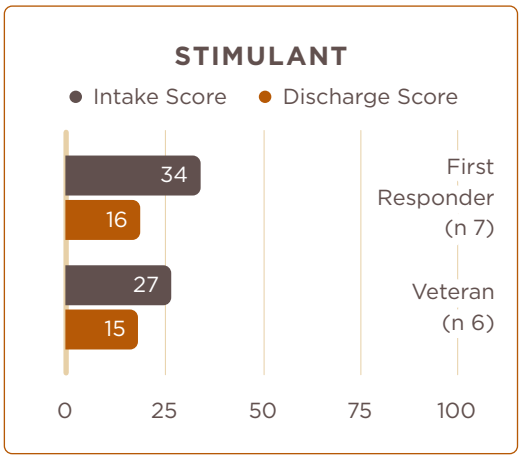






Note that there were several cases where moderate to large effect sizes were paired with a non-significant ("ns") statistical test result. (For example, reductions in cravings for sedatives in first responders and veterans.) This illustrates that statistical significance isn't just based on how large the change is, but on how often it is seen. Together these determine whether the decrease is reliable.





It's also worth noting that veterans had larger reductions in cravings for all substances (except stimulants, where it was about a tie). This suggests the Red, White, and Blue program is particularly good at addressing substance use in veterans.

OUTCOMES AFTER LEAVING TREATMENT

Everyone who completes Sierra Tucson's residential treatment receives one free year of recovery coaching. This recovery coaching program is called Connect 365, and it also helps us collect information on how people are doing after they leave treatment.

After people leave treatment, they don't continue to fill out a long series of questionnaire measures rating their symptoms and psychological functioning. Instead, the provide responses to a series of seven questions from the U.S. National Outcomes Measures (NOMS). This is a quicker and easier way to get an idea of how people are doing that respects how busy people's lives are outside of treatment.

Three subjective ratings are provided. We ask people to respond on a scale of 1 to 5 (with 1 being worst, 5 being best) about the following areas:

- How well can they handle stress?
- How would they rate their quality of life?
- How would they rate the important relationships in their lives?

Four objective ratings are provided. We ask people to say how many days, out of the last 30 days, they engaged in the following behaviors:

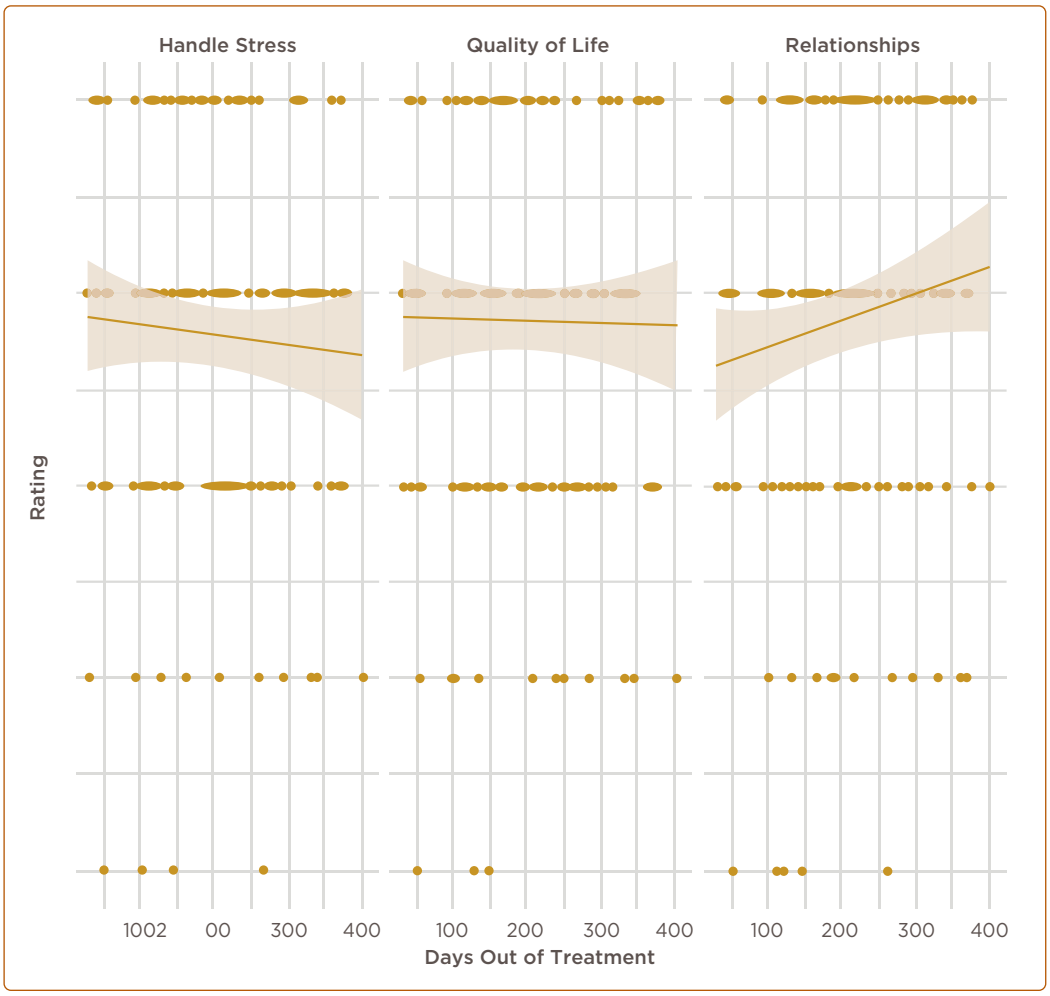
- Received medical care at a hospital or emergency room
- Were paid for work
- Attended support groups, like AA or NA
- Used substances

This data is analyzed below by looking at how people's outcomes changed over their first year after leaving treatment. Statistical tests are run to determine if there is a significant change in these outcomes based on how long the person has been out of treatment.

On the following pages we present the overall changes for everyone who provided outcomes data to Connect 365, and we provide outcomes data based on which program an individual was in. We just began adding outcomes data on the Red, White, and Blue program—such as whether an individual is a first responder or veteran—this year, so we expect to have post-discharge data available next year.

SUBJECTIVE RATINGS AFTER LEAVING TREATMENT

In the figure below, each dot represents an individual answer to one of the questions. Along the horizontal axis is the number of days since someone left treatment (from 1 day out to 400 days out—for a person who continued with Connect 365 longer than a year). The further to the right, the longer they have been out. The vertical axis is the response to the question. The lines indicate the trend over time.



The following table contains the results of statistical tests for the trend over time. These are tests of whether ratings change based on how long it has been since someone left Sierra Tucson.

Measure	Change Per Month (30 Days)	*p-value*	*Sig*	Interpretation
Handle Stress	-0.007 points	.730	NS	No significant change
Quality of Life	0.003 points	.891	NS	No significant change
Relationships	0.045 points	.049	*	Improvement Over Time

SUBJECTIVE RATINGS AFTER LEAVING TREATMENT (CONT.)

These results indicate that:

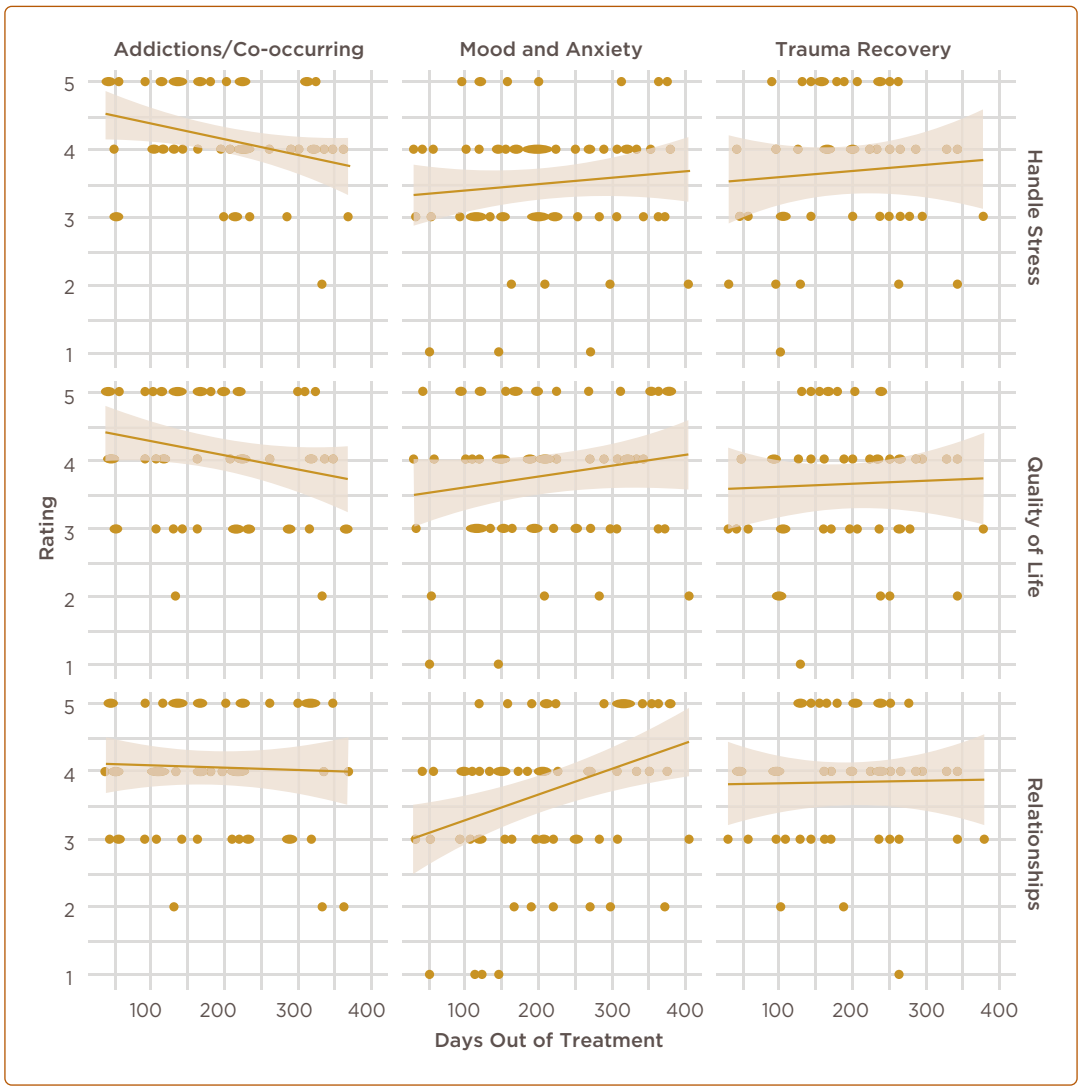
- A person's ability to handle stress does not change significantly the longer they are out of Sierra Tucson. Although the line is trending downwards in the graph above, the change isn't large enough to reliably say that a person leaving Sierra Tucson loses the ability to handle stress the longer they've been out. One way to understand this is by looking at where the line starts and ends: on day 1 after leaving, we expect an average rating of around 3.9 out of 5. On day 365, we expect an average rating of 3.7 out of 5. That's not a big enough decrease to reliably say the skill will decline.
- A person's quality of life does not change significantly the longer they are out of Sierra Tucson. We can see that the line here is more or less flat—indicating no change.
- The strength of a person's important relationships improves the longer they are out of Sierra Tucson. We can see that the line trends up here. This suggests that as the skills people learned at Sierra Tucson are implemented in their relationships back home, those relationships start to improve!

SUBJECTIVE RATINGS AFTER LEAVING TREATMENT BY PROGRAM

The figure below shows the differences in trends over time by which program an individual was in.

There were no significant differences in the trends for handling stress over time, although we can see that ratings of handling stress started a bit higher in people leaving the Addiction Recovery program.

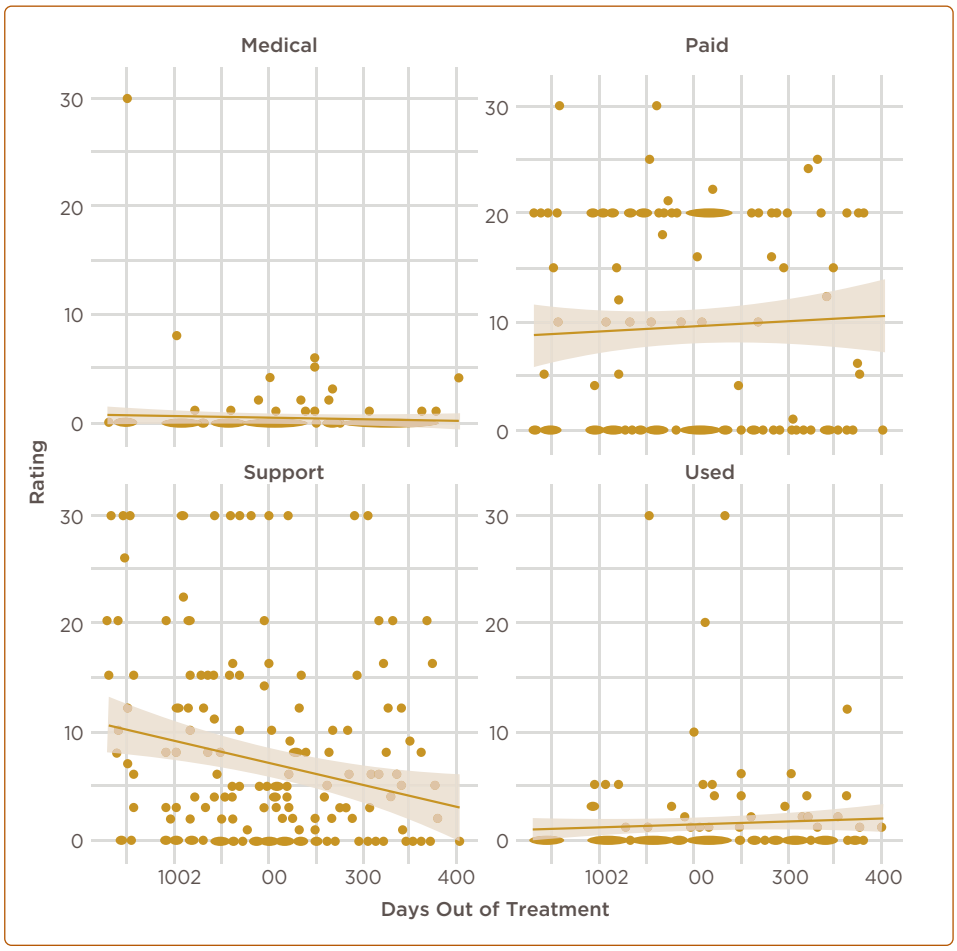
There were no significant differences in the trends for quality of life over time, although we can see that ratings of quality of life started a bit higher in people leaving the Addiction Recovery program.



There was a significant difference in trends for relationships over time. People in the Mood Recovery program had a clear improvement in the quality of their close relationships, while those in other programs merely maintained the gains made in treatment.

OBJECTIVE RATINGS AFTER LEAVING TREATMENT

The figure below can be interpreted like those above, but for questions with more objective answers. These questions ask about how frequently an individual did something, such as needed medical care or attended a support group, out of their last 30 days. Each dot represents an individual answer to one of the questions. Along the horizontal axis is the number of days since someone left treatment (from 1 day out to 400 days out—for a person who continued with Connect 365 longer than a year). The further to the right, the longer they have been out. The vertical axis is the number of days (from 0 to 30). The lines indicate the trend over time.



The table below contains the results of statistical tests for the trend over time. These are tests of whether actions taken in the last month change based on how long it has been since someone left Sierra Tucson.

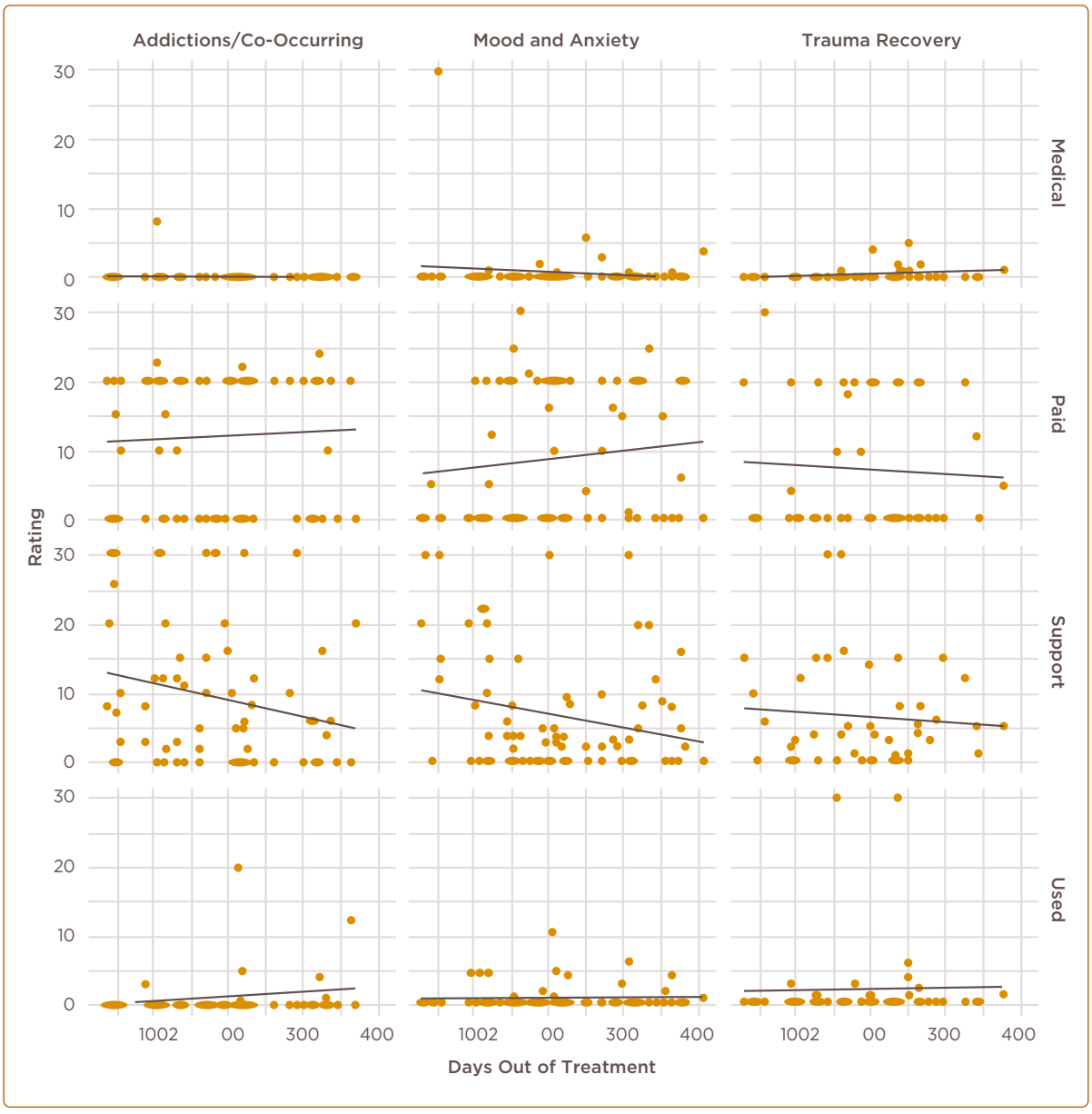
Measure	Change Per Month (30 Days)	*p-value*	*Sig*	Interpretation
Medical Care	-0.0002 days	.993	NS	No significant change
Paid for Work	0.06 days	.788	NS	No significant change
Support Groups	-0.54 days	.007	**	Decrease Over Time
Used Substances	0.07 days	.119	NS	No significant change

These results indicate that:

- The number of days an individual needed medical care (in a hospital or ER) did not change over time. As can be seen in the figure above, it started low and stayed low. This is an indication that serious issues were not lingering after treatment.
- The number of days an individual was paid for work did not change over time. As can be seen in the figure, a large group of individuals were able to resume full-time work (20 or more days per month). Another group was not able to resume work (see all the points at 0 days). This ratio remained roughly the same for the next year.
- The number of days an individual used support groups decreased over time. This suggests a natural progression in treatment after people leave Sierra Tucson. When people first leave, they often go to a lot of groups (over 10 per month, on average). After a full year, they go less often (on average around 4 per month).
- The number of days an individual used substances did not change in the first full year after treatment. As can be seen in the figure above, people leaving treatment typically did not use substances at all. There were a handful of cases of relapse (see the dots above zero), but these instances did not happen on any particular schedule or after a shorter or longer time out of treatment.

OBJECTIVE RATINGS AFTER LEAVING TREATMENT BY PROGRAM

The figure below shows the differences in trends over time by which program an individual was in. There were no significant differences in the trends over time for any of the objective ratings when divided out by program. Although there are slight differences in trend observable from the figure, none of these was large enough to be statistically significant. That means they are likely not reliable differences between programs.



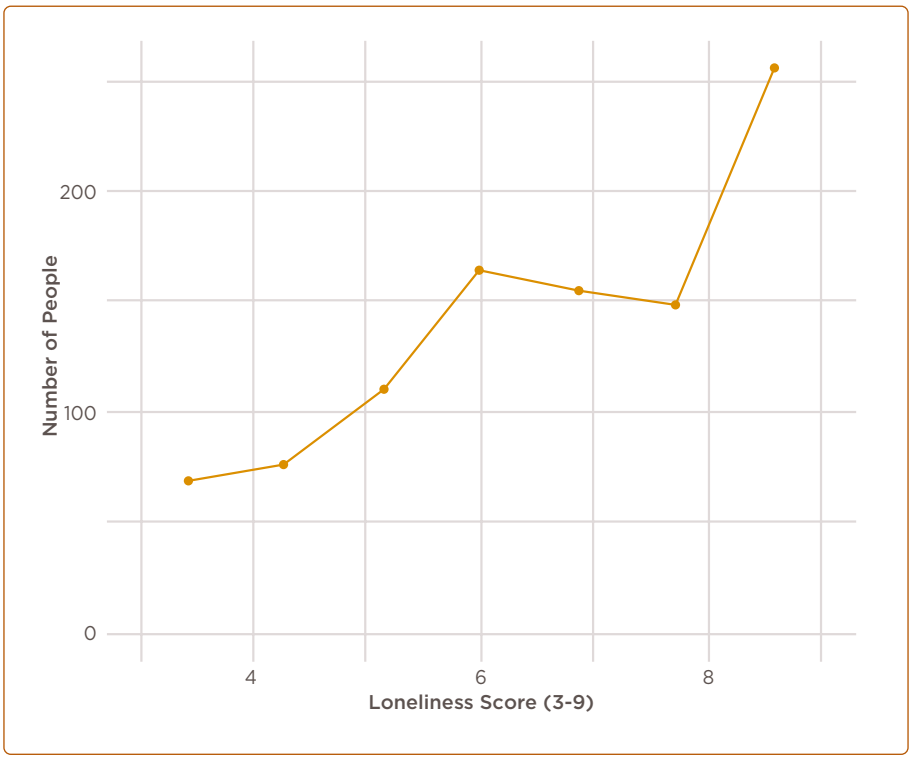
RESEARCH FOCUS: LONELINESS

In 2023, the U.S. Surgeon General declared loneliness an "epidemic." It's common throughout the country, and has negative consequences for both physical and mental health. In a 2020 meta-analysis by Park and colleagues, loneliness was found to be correlated with depression, anxiety, poor sleep, lower ratings of well-being, and lower ratings of physical health. That meta-analysis suggests that loneliness leads to generalized stress, which can lead into both unhealthy behaviors (such as not being as active or substance use) and chronic inflammation. The chronic inflammation can, in turn, lead to issues with heart and circulation health.

Clinicians treating individuals with substance use disorders also identify loneliness as an underlying cause of substance use. Being lonely can lead to painful feelings, and using substances can help numb some of those feelings. Bill W., a co-founder of Alcoholics Anonymous, wrote "almost without exception alcoholics are tortured by loneliness." As you'll see in the data presented below, people seeking treatment for mood disorders and trauma recovery are also often lonely. By exploring loneliness in our residents, we hoped to gain some deeper insight into why they may be experiencing psychological distress.

DISTRIBUTION OF LONELINESS SCORES AT THE START OF TREATMENT

The figure below is a histogram of loneliness scores for residents at the start of treatment at Sierra Tucson. Our loneliness scale runs from 3 to 9, and the height of each bar shows how many people had a specific score. A couple of features stand out from this figure: At the start of treatment, 26% of residents were at the maximum possible score for loneliness, and 57% were above the midpoint. **Most people enter treatment lonely.**



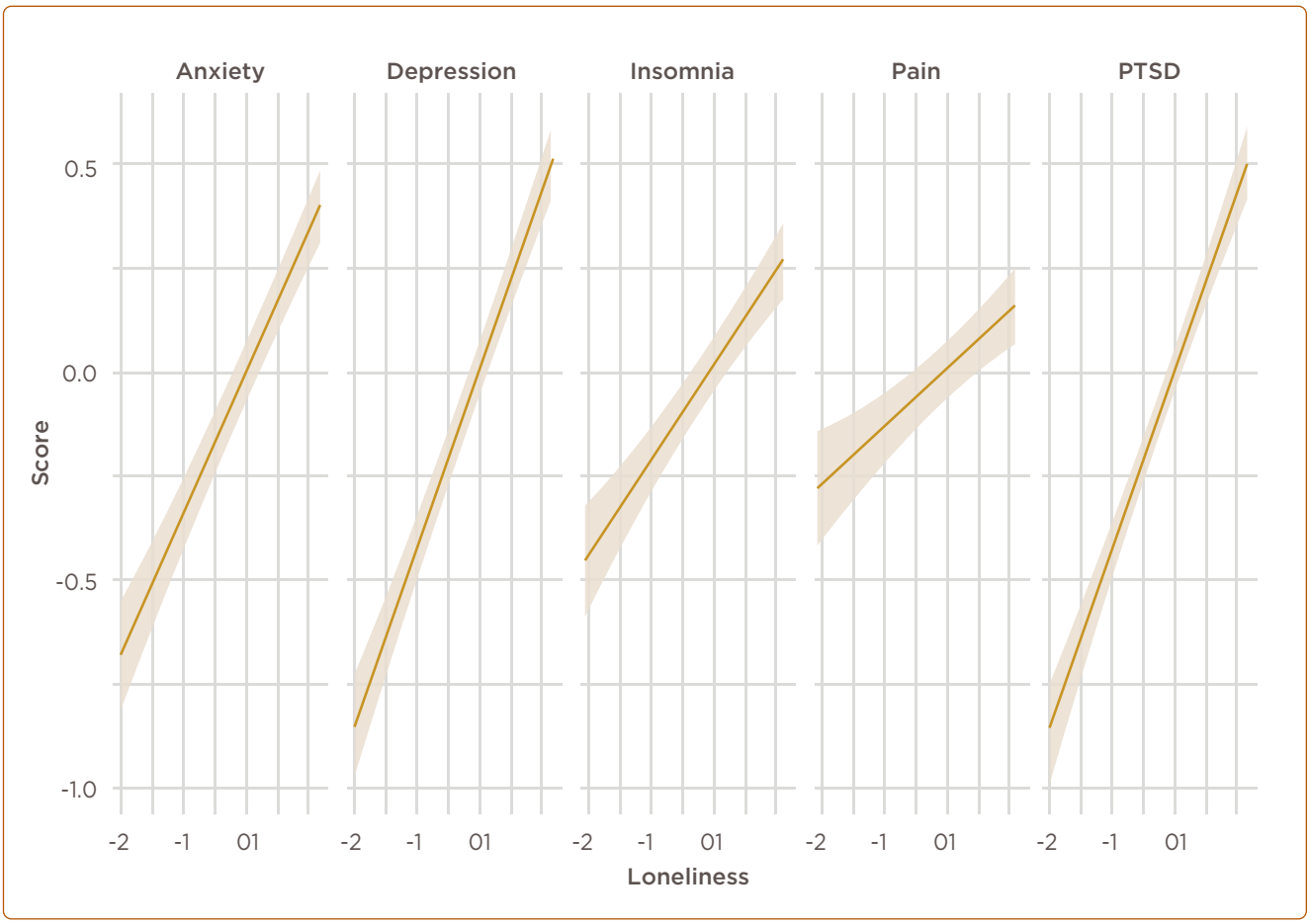
CORRELATION OF LONELINESS WITH CORE SYMPTOM MEASURES

Loneliness is associated with all of our core symptom measures. If people start treatment with higher levels of loneliness, they're likely to also have higher levels of symptoms—especially PTSD and depression symptoms.

In the accompanying table, the correlation of loneliness with each of these measures is presented. All of these correlations are statistically significant (with p <.001).

These same relationships are visualized in the table on below. The steeper the line, the stronger the association.

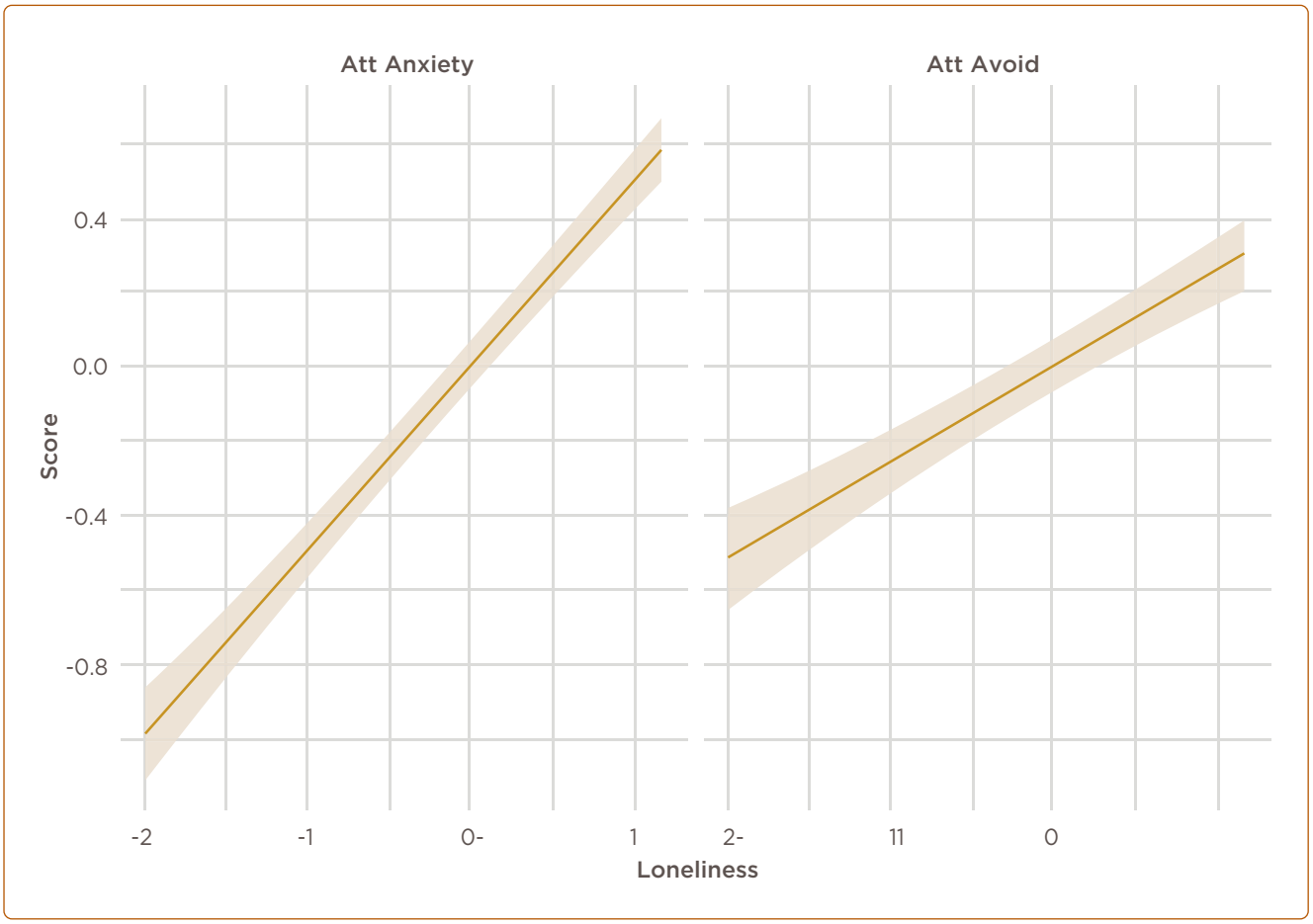
Outcome	Correlation with Loneliness
Depression	0.43
Anxiety	0.34
PTSD	0.44
Chronic Pain	0.14
Insomnia	0.23



CORRELATION OF LONELINESS WITH ADULT ATTACHMENT STYLE

Loneliness is also correlated with people's adult attachment styles. This means that people who are lonelier also have more difficulty forming strong attachment bonds. Loneliness is more strongly correlated with attachment anxiety, which is a person's tendency to worry that the person they are in a close relationship with will not be available or able to give them the amount of closeness they want. This makes sense, as loneliness is about not having the degree of social contact and connection that you would want. Attachment anxiety taps into that specifically in a person's closest relationships.

Loneliness also has a substantial and significant correlation with attachment avoidance, which is a person's tendency not being comfortable depending on others. People with attachment avoidance often act as if they don't want to get close to others, and can report feeling uncomfortable when others try to get too close. However, this correlation suggests that this tendency to push others away is linked to loneliness. In other words, it's not just a preference for time alone or for distance. People with high attachment anxiety don't trust others in close relationships, but being disconnected in this way feels lonely.



LONELINESS AND TREATMENT AT SIERRA TUCSON

Sierra Tucson's internal research on loneliness and mental health, presented above, suggests that people who are lonely have both worse mental health and a harder time forming strong, secure attachments to others. This suggests to us that loneliness is not just a matter of not missing opportunities for socializing, but that loneliness is related to deeper "working models" of how close relationships should look. People who are lonely are more likely to have attachment styles that make close relationships more difficult. They are both more likely to feel like they can't get the amount of attention and care they want (e.g., have high attachment anxiety), and that they don't trust others enough to open up and depend on them (e.g., have high attachment avoidance).

Knowing that loneliness is related to attachment style suggests that reducing it is not just a matter of joining a gym or watching a show with friends. It's about changing the way that people understand close relationships. That work can be done in therapy. In our earlier sections on outcomes, we show that attachment styles do improve when people receive treatment at Sierra Tucson. Attachment anxiety gets reduced, and attachment closeness (which is the opposite of avoidance) increases. We also show that as these changes are taking place, loneliness decreases.

In fact, one of the largest improvements in broader psychological functioning we see at Sierra Tucson is a reduction in loneliness. We believe this is due to our strong therapeutic and medical teams, but there is also a "secret sauce." When people leave their day-to-day surroundings and come to residential mental health treatment here, they are becoming a part of a community of healing. The other residents are fellow travelers, taking time for introspection and working towards deeper self-understanding. These are people who are looking for a different way to relate to others, apart from substance use, cycles of low mood, and histories of trauma. This allows space for more genuine connections to form. There is both a vulnerability in admitting when things aren't working, and a strength in being willing to address it. This state of mind can help people feel more open, better understood by others, and less lonely.

This is a topic Dr. Danvers has presented on frequently in the last year at Sierra Tucson events, and in a talk at the 2023 Association for Psychological Science (APS) scientific conference. We present it here to show how collecting and analyzing outcomes data doesn't just tell us how well we're doing as a mental health facility, but it also suggests new connections and ways of thinking about improving our residents' mental health.

CONCLUSION AND OVERVIEW

Sierra Tucson continued to have strong clinical outcomes in 2024. Overall, there were large changes in residential treatment in our three core symptom measures. (Below I present the percentage change, plus the effect size based on the Cohen's d effect size statistic.):

- **Depression reduced by 49% on average (large effect size)**
- **PTSD symptoms reduced by 45% on average (large effect size)**
- **Anxiety reduced by 45% on average (large effect size)**

There were also significant changes in all of our psychological functioning measures. Particularly large changes were seen in:

- **Coping with Emotions increased by 47% on average (medium effect size)**
- **Loneliness reduced by 32% on average (medium effect size)**
- **Satisfaction with Life increased by 46% (medium effect size)**

Additionally, we had strong effects in our Red, White, and Blue (RWB) program, which serves Veterans and First Responders.

- **PTSD reduced by 48% on average in First Responders (large effect size)**
- **PTSD reduced by 39% on average in U.S. Military Veterans (large effect size)**
- **Depression reduced by 55% on average in First Responders (large effect size)**
- **Depression reduced by 44% on average in U.S. Military Veterans (large effect size)**
- **Anxiety reduced by 53% on average in First Responders (large effect size)**
- **Anxiety reduced by 42% on average in U.S. Military Veterans (large effect size)**

These large effects remained for all of our three primary programs: Addiction and Co-Occurring Disorders Recovery, Mood Recovery, and Trauma Recovery. Some of the effects in each program stood out as being a bit stronger than in other programs.

For the Addiction Recovery program, this includes:

- **Insomnia symptoms reduced by 40% on average (large effect size)**
- **Loneliness reduced by 41% on average (medium effect size)**

For the Mood Recovery program, this includes:

- **Coping with Problems increased by 19% on average (small effect size)**
- **Resilience increased by 34% on average (small effect size)**

For the Trauma Recovery program, this includes:

- **Anxiety reduced by 53% on average (large effect size)**
- **Coping through Community increased by 30% on average (small effect size)**

These results demonstrate that Sierra Tucson has exceptional outcomes for all of its residents, including veterans and first responders. These outcomes are also strong across all of our primary programs—Addiction Recovery, Mood Recovery, and Trauma Recovery. These programs also have unique strengths—such as exceptional insomnia reduction in the Addiction Recovery program and exceptional anxiety reduction in the Trauma Recovery program—that match the symptoms of individuals needing these types of care.

Thank you for your interest in Sierra Tucson's mental health treatment outcomes. We are proud of the work we do, and I hope seeing those improvements captured in the data help you understand just how much care and attention goes into helping all of our residents.

Thank you,

Alex Danvers PhD

Alex Danvers, PhD, Director of Treatment Outcomes

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