
SUNCLOUD

TREATMENT IMPACT REPORT

Executive Summary

This report summarizes treatment outcomes for SunCloud, a centre that focuses on complex needs presented by clients who struggle with mental, behavioural, and relationship health issues. Detailed in this document are the client characteristics and treatment outcomes for over 289 patients who have received services since 2018.

The purpose of this document is to examine the impact of treatment. It can serve as a tool to offer accountability to SunCloud's clients, staff, and other stakeholders – it offers understanding of whether clients change, by how much, and what might foster that change. It can also be used to celebrate successes and examine areas for professional development and continuous quality improvement.

Overall, the evaluation tells us that SunCloud treatment helps clients reduce their mental health symptoms between admission and departure. Specifically, on areas of Symptom Distress such as Depression and Anxiety, clients who attend SunCloud experience significant improvements over the course of treatment.

It's not surprising that we found that certain clients enter treatment with more symptom severity than others; women more severe than men; those who are assigned to the more intensive program (PHP) more severe than those admitting to IOP; those assessed with multiple mental health diagnoses more severe than those with fewer mental health diagnoses.

When we look at the degree of change, however, men and women experience similar improvements, and change was not different based on the number of diagnoses at admission. Those who were IOP (and started with healthier scores) changed more profoundly than those admitting to PHP.

Completion of treatment was a significant contribution to better client outcomes, and relatedly, those whose discharge decision was clinician-oriented had optimal outcomes when compared to those whose decision was client or external.

One factor that emerged as a flag was substance use among clients, which predicts less healthy scores at admission and appears to be a roadblock to successful outcomes. As such, professional development in the area of treatment of substance use may serve to optimize care for clients at SunCloud Health.

Evaluation Methodology

Administration. Survey bundles with instruments that assess mental health, relationships, and social behavior, are administered weekly from the time of admission, through to departure, and again at 1-month, 6-months, and 1 year after treatment.

Timelines. Survey completion times were categorized as

Admission ($n = 380$): within 14 days of treatment entry;
Discharge ($n = 332$): within 14 days before or after departure date;
1M Post-Tx ($n = 110$): 15 – 45 days after departure;
6M Post-Tx ($n = 49$): 135 – 225 days after departure; and,
1Y Post-Tx ($n = 21$); 320 – 400 days after departure.

Of this group of 428 clients who contributed data at some timepoint, 289 completed surveys at both Admission and Discharge. They do not differ from clients who did not complete both timepoints across admission year, age, sex, or any OQ45.2 score. Results for SunCloud Admission to Completion analyses are based on these 289 clients.

Understanding Statistical Notation. The analyses look at difference between groups, at pre-treatment and by whether different groups change differently from admit to discharge. In either case, Analysis of Variance (ANOVA) or Repeated Measures ANOVA procedures were used.

As an example, the change scores from pre- to post-treatment on our main variable of interest was significant ($F_{(288)} = 121.8, p < .005, \eta^2 = .30$). The F tells us we conducted an analysis of variance and will see a number (121.8) which looks at the amount of change from pre- to post-treatment for all clients. The further F is from 1, the more likely that the amount of change is significant. The **288** after the F is an indication of the number of clients in the analysis, minus 'degrees of freedom', which in this case was 1; there were 289 clients. The **p-value** tells us how likely our results are erroneous. Any p -value less than .05 lets us know that there's a good chance that our findings were not erroneous due to random sampling. Finally, η^2 , or eta-squared (.30 in our case), or the magnitude of **treatment effect**. η^2 can be said as '30% of the variability in change scores can be attributed to the time between Admit and Discharge'. In other words, there are many things that might affect how much people change over the course of treatment, including sex/gender, age, year of entry, etc., but our evaluation tells us that without accounting for any of that, 30% of the amount of change can be attributed to the time between admit and discharge. It must be noted that we can't say that this means that treatment **caused** this change, as clients were not randomly assigned to treatment and no-treatment groups, but we can say that, knowing there may be other things that happened in clients lives between admit and discharge, treatment was one of them. Not everybody loves to break down statistical notation, and for the rest of the document, all notation will be recorded in footnotes.

Demographics and Treatment Process.

At admission, data were recorded for age (average = 32.6, median = 29.3, SD = 12.1), sex, previous level of care, mental health diagnosis, subjective risk, and treatment program. At discharge, which ranged from 4 to 325 days from admission and was an average of 55 days (median = 46; SD = 42.9), treatment progression, and discharge decision were recorded by the clinical team. These data are detailed below (Table 1). Due to missing data, in some cases the sum of percentages for an indicator may not equal 100%. For diagnoses, many clients were assessed at admission with more than one and thus the sum diagnosis % is greater than 100%

Table 1. Client Demographic and Treatment Progress Information

		N	%
Year of Admission	2018	104	36%
	2019	185	64%
Sex	Female	231	80%
	Male	56	19%
	Unknown	2	1%
Previous Level of Care	None	99	36%
	Another IOP/PHP	31	11%
	Referring OP	49	18%
	Residential	49	18%
	Inpatient	50	18%
Subjective Risk	Low	4	1%
	Medium	145	50%
	High	130	46%
Treatment Program	IOP	209	72%
	PHP	67	23%
Treatment Location	Chicago	23	8%
	Naperville	18	6%
	Northbrook	42	14%
Treatment Progression	Full	142	49%
	Partial	134	46%
Discharge Decision	Client	84	29%
	Provider	180	62%
	External	12	4%
Number of Diagnoses	None	5	2%
	One	38	13%
	Two	88	30%
	Three	105	36%
	Four	46	16%
	Five	5	2%
	Six	2	1%
Diagnosis at Admission	Anxiety / Depression	262	91%
	PTSD	156	54%
	Substance Use	140	48%
	Anorexia	86	30%
	Binge Eating	24	8%
	Bulimia	20	8%
	Other	50	18%

TREATMENT OUTCOMES

Mental, Relationship, and Social Health.

Outcome Questionnaire 45.2 (OQ45.2). The OQ45.2 is the treatment outcome indicator for this evaluation. It is a 45-item instrument with three sub-scales: **Symptom Distress**, which assesses internalizing issues such as depression and anxiety, **Interpersonal Relations** is a proxy for social relationships, and **Social Role** assesses compliance with the law and other social behavior. The **OQ Total Score** and each of the subscales have clinical indicator **benchmarks** to indicate the point above which can be considered clinically problematic and each has a known 'reliable change index (RCI)' for ease in understanding whether therapeutic change is significant. The Total score and all sub-scales have good validity, test-retest reliability (.78-.84), internal consistency (.74-.93).

At admission, average scores on all OQ sub-scales and on the Total score were above the clinical benchmark, indicating clinically problematic functioning. The amount of change on all OQ scores was significant¹, and exceeded the RCI on Symptom Distress and Total Score (Table 2).

Table 2. Average OQ Total and Sub-Scale Scores for All SunCloud Clients Pre-to Post-Treatment

	Symptom Distress	Interpersonal Relations	Social Role	OQ Total
Clinical Benchmark	36	15	12	63
Pre-Treatment	52.6	19.1	15.0	86.7
Post-Treatment	42.2	16.1	11.6	70.0
Reliable Change Index (RCI)	10	8	7	14
Average Change	10.4	3	3.4	16.7

The findings below indicate whether demographics and treatment process factors influence how clients *change* from pre- to post-treatment on the OQ Sub-scales and Total score.

Year of Admission. Clients admitted in 2018 had higher scores (avg = 20.2) than those in 2019 (avg = 18.4) on Interpersonal Relations, but similar scores on all other scales². The year of admission did not influence how patients change on treatment outcomes³.

Age. The amount of change on all OQ sub-scales and the total score was not predicted by client age.

¹ OQ45.2 score change for SD ($F_{(288)} = 120.2, p < .001, \eta^2 = .29$); IR ($(F_{(288)} = 62.4, p < .001, \eta^2 = .18)$); SR ($F_{(288)} = 105.1, p < .001, \eta^2 = .27$) and Total ($F_{(288)} = 121.8, p < .001, \eta^2 = .30$).

² Higher scores in 2018 on IR at admission ($F_{(287)} = 4.6, p = .03, \eta^2 = .02$).

³ No difference pre- to post-treatment based on year of entry on SD ($(F_{(287)} = 1.7, p = .2, n.s.)$), SD ($F_{(287)} = 2.0, p = .16, n.s.$), IR ($(F_{(287)} = .09, p = .8, n.s.)$), SR ($F_{(287)} = .02, p = .9, n.s.$), SR ($F_{(287)} = .8, p = .4, n.s.$).

Sex / Gender. At admission, women score higher than men on Symptom Distress, Interpersonal Relations, and OQ Total Score but similarly to men on Social Role⁴. Men and women improve similarly from admission to departure on all OQ measures⁵ (change scores detailed under DIFF in Table 3, bolded if in excess of RCI).

Table 3. Average OQ Scores at Admit & Discharge with Amount of Change by Sex/Gender.

	Symptom Distress			Interpersonal Relations			Social Role			OQ Total		
Clinical Benchmark	36			15			12			63		
Reliable Change Index	10			8			7			14		
	AD	DI	DIFF	AD	DI	DIFF	AD	DI	DIFF	AD	DI	DIFF
Women (n= 231)	54.6	44.0	14.6	19.6	16.4	3.2	15.2	11.7	3.5	89.6	72.4	17.2
Men (n = 56)	44.9	34.6	10.3	17.2	15.0	2.2	14.3	10.9	3.4	76.3	60.4	15.9

Previous Level of Care. When clients admit to SunCloud, scores were not different based on previous level of care on any OQ measure⁶. The amount of change varied based on previous level of care for Symptom Distress and Total Score; those who had no previous level of care experienced the most change⁷. On Interpersonal Relations and Social Role, the amount of change did not differ based on previous level of care⁸.

Table 4. OQ Scores at Admit & Discharge with Amount of Change by Previous Level of Care.

	Symptom Distress			Interpersonal Relations			Social Role			OQ Total		
Clinical Benchmark	36			15			12			63		
Reliable Change Index	10			8			7			14		
	AD	DI	DIFF	AD	DI	DIFF	AD	DI	DIFF	AD	DI	DIFF
None (n=101)	52.2	38.7	13.5	18.9	15.2	3.7	15.2	11.1	4.1	86.3	65.1	21.2
Other IOP/PHP (n=31)	54.5	45.2	9.3	16.4	14.8	1.6	14.8	11.6	3.2	86.0	71.8	14.2
Ref'ng Therapist (n=52)	49.2	39.0	10.2	18.9	15.6	3.3	14.0	11.2	2.8	82.1	65.9	16.2
Residential (n=50)	55.5	51.1	4.4	20.6	19.4	1.2	15.2	12.7	2.5	91.6	83.8	7.8
Inpatient (n=50)	53.1	42.6	10.5	19.6	15.8	3.8	15.4	11.8	3.6	88.2	70.2	18.0

⁴ Women score higher than men at admission on SD ($F_{(285)} = 19.0, p < .001, \eta^2 = .06$), IR ($F_{(285)} = 5.8, p = .02, \eta^2 = .02$), and OQ Total ($F_{(285)} = 14.7, p < .001, \eta^2 = .05$) but no difference on SR ($F_{(285)} = 1.5, p = .2, \eta^2 = 0$).

⁵ No difference in amount of change between men and women on SD ($F_{(285)} = .02, p = .9, n.s.$), IR ($F_{(285)} = 1.2, p = .3, n.s.$), SR ($F_{(285)} = .005, p = .9, n.s.$), and Total ($F_{(285)} = .1, p = .8, n.s.$).

⁶ No difference on admit scores based on previous level of care for SD ($F_{(279)} = 1.2, p = .3, \eta^2 = .02$), IR ($F_{(279)} = 1.8, p = .1, \eta^2 = .03$), SR ($F_{(279)} = .6, p = .7, \eta^2 = .01$), or Total ($F_{(279)} = 1.1, p = .4, \eta^2 = .02$).

⁷ Change different based on previous level of care for SD ($F_{(279)} = 2.9, p = .02, \eta^2 = .04$) and Total ($F_{(279)} = 2.4, p = .05, \eta^2 = .03$).

⁸ Change not different based on previous level of care for IR ($F_{(279)} = 1.7, p = .1, \eta^2 = .02$) or SR ($F_{(279)} = .9, p = .4, \eta^2 = .01$).

Subjective Risk. At admission, each client is assigned a degree of risk (low, medium, high) by his or her clinician. We examined whether this indicator predicted pre-treatment scores or changes in health. On Symptom Distress, scores were not different, but on Interpersonal Relations, Social Role, and Total score, scores were different for different levels of assessed risk, however, the amount of change was not significantly different on any subscale or the total score; clients changed similarly regardless of assessed risk⁹ (Table 3).

Table 5. OQ Scores at Admit & Discharge with Amount of Change by Assessed Risk.

	Symptom Distress			Interpersonal Relations			Social Role			OQ Total		
	AD	DI	DIFF	AD	DI	DIFF	AD	DI	DIFF	AD	DI	DIFF
Clinical Benchmark	36			15			12			63		
Reliable Change Index			10			8			7			14
Low Risk (<i>n</i> = 4)	56.8	34.2	22.6	22.5	17.5	5.0	21.0	11.5	9.5	103.2	63.2	40
Moderate Risk (<i>n</i> = 145)	51.0	40.6	10.4	17.7	14.8	2.9	14.3	10.9	3.4	82.9	66.5	16.4
High Risk (<i>n</i> = 133)	54.1	44.3	9.8	20.3	17.3	3.0	15.4	12.2	3.2	90.0	74.1	15.9

⁹ Admission scores not different by Risk on SD ($F_{(2,79)} = 1.7$, $p = .2$, $\eta^2 = .01$), but were different on IR ($F_{(2,79)} = 6.6$, $p = .002$, $\eta^2 = .04$), SR ($F_{(2,79)} = 5.0$, $p = .007$, $\eta^2 = .04$), and Total ($F_{(2,79)} = 4.1$, $p = .02$, $\eta^2 = .03$). Change scores not different by Risk on SD ($F_{(2,79)} = .9$, $p = .4$, $\eta^2 = .01$), IR ($F_{(2,79)} = 1.2$, $p = .3$, $\eta^2 = .01$), SR ($F_{(2,79)} = 2.4$, $p = .09$, $\eta^2 = .02$), or Total ($F_{(2,79)} = 1.7$, $p = .2$, $\eta^2 = .01$).

Treatment Allocation. When clients start treatment at SunCloud, they enter either to the less intensive IOP (n = 209) or more intensive PHP (n = 67) program. On Symptom Distress, Interpersonal Relations, and Total Score those admitted to PHP have more clinically problematic scores than those admitted to IOP and those in IOP experience more change than those in PHP (Figure 1a, b, d). On Social Role, client scores are not different at admission but change differently; those in IOP experience more profound clinical change (Figure 1c)¹⁰.

Figure 1a. Average Symptom Distress at Admit & Discharge by Treatment Allocation

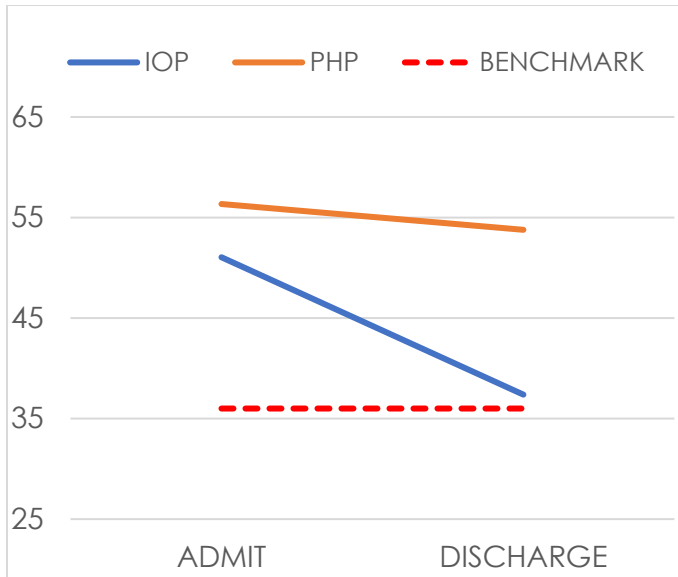


Figure 1b. Average Interpersonal Relations at Admit & Discharge by Treatment Allocation

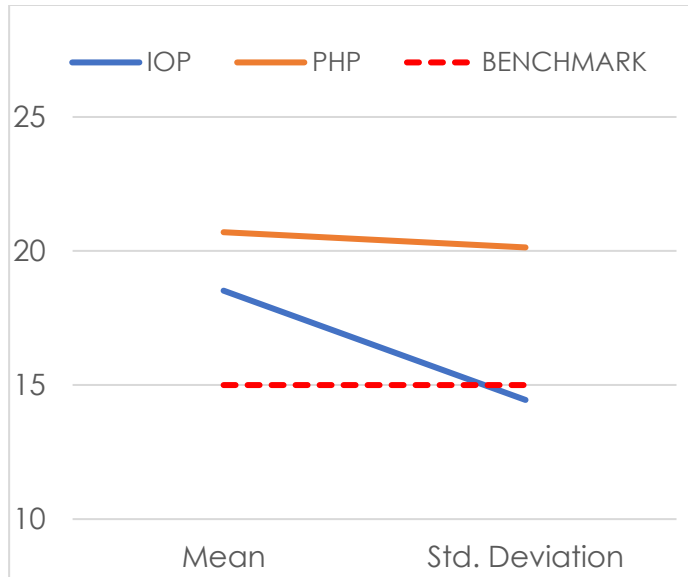


Figure 1c. Average Social Role at Admit & Discharge by Treatment Allocation

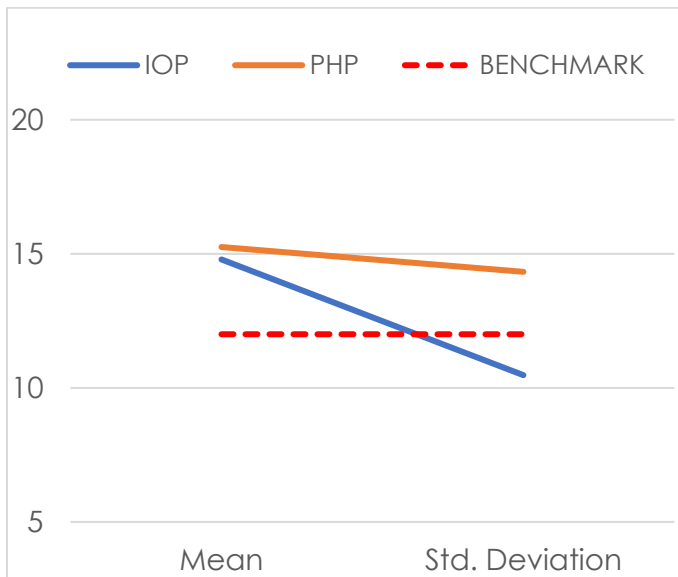
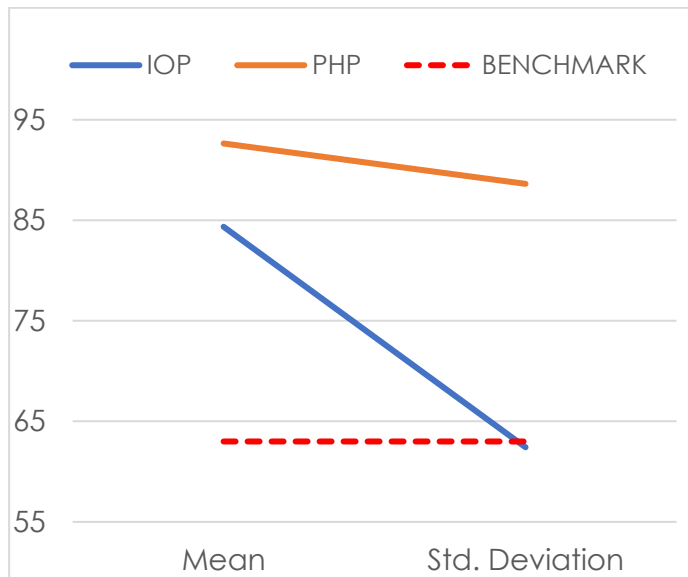


Figure 1d. Average OQ Total Score at Admit & Discharge by Treatment Allocation



¹⁰ Clients in PHP have higher scores at admit than those in IOP on SD ($F_{(274)} = 6.0, p = .02, \eta^2 = .02$), IR ($F_{(274)} = 5.0, p = .03, \eta^2 = .02$) and Total ($F_{(274)} = 5.2, p = .01, \eta^2 = .02$); no difference on SR ($F_{(274)} = .4, p = .5, \eta^2 = 0$); change different based on treatment allocation for SD ($F_{(274)} = 27.3 < .001, \eta^2 = .09$), IR ($F_{(274)} = 16.6 < .001, \eta^2 = .06$), SR ($F_{(274)} = 12.0, p = .001, \eta^2 = .04$), and Total ($F_{(274)} = 28.3, p < .001, \eta^2 = .09$).

Treatment Location. Starting in 2019, SunCloud expanded and now has three treatment locations: Chicago, Naperville, and Northbrook. Client scores on OQ Subscales and Total Score were not different based on location and did not change differently on sub-scales or total score¹¹, but on Symptom Distress and Total Score improvements at Chicago and Northbrook exceeded the RCI; those in Naperville did not (Table 6). It should be noted that because this is a more recently recorded indicator, the number of clients is small, and results should be interpreted with caution.

Table 6. OQ Scores at Admit & Discharge with Amount of Change by Treatment Location.

	Symptom Distress			Interpersonal Relations			Social Role			OQ Total		
Clinical Benchmark	36			15			12			63		
Reliable Change Index	10			8			7			14		
	AD	DI	DIFF	AD	DI	DIFF	AD	DI	DIFF	AD	DI	DIFF
Chicago (n= 23)	51.7	39.2	12.5	20.2	15.2	5.0	16.6	11.4	5.2	88.5	65.8	22.7
Naperville (n = 18)	58.5	50.1	8.4	19.8	18.2	1.6	15.2	13.0	2.2	93.4	81.3	12.2
Northbrook (n = 42)	51.3	36.3	15.0	19.9	15.7	4.1	14.5	10.3	4.2	85.7	62.4	23.3

Mental Health Diagnosis. Most clients at SunCloud are assessed with more than one disorder at admission; the average number of diagnoses is 2.6. Female clients entered SunCloud with more diagnoses (average 2.7) than male clients (average 2.2)¹². OQ scores at admission are typically higher for clients assessed with more diagnoses¹³. To assess change, clients with none, five, or six diagnoses were excluded from analyses due to small numbers in each group. The amount of change was not different based on number of diagnoses for any sub-scale or the Total score¹⁴

Table 7. OQ Scores at Admit & Discharge with Amount of Change by Number of Diagnoses at Admit.

	Symptom Distress			Interpersonal Relations			Social Role			OQ Total		
Clinical Benchmark	36			15			12			63		
Reliable Change Index	10			8			7			14		
	AD	DI	DIFF	AD	DI	DIFF	AD	DI	DIFF	AD	DI	DIFF
0 Diagnoses (n = 5)	47.6	34.8	12.8	21.2	17.0	4.2	14.8	10.6	4.2	83.6	62.4	21.2
1 Diagnosis (n = 38)	46.2	33.7	12.5	16.9	14.7	2.2	14.7	10.7	4.0	77.8	59.0	18.8
2 Diagnoses (n = 88)	48.4	37.0	11.4	17.7	14.1	3.6	14.0	10.5	3.5	80.1	61.6	18.5
3 Diagnoses (n = 105)	55.0	45.3	9.7	19.2	16.2	3.0	15.0	11.8	3.2	89.2	73.5	15.7
4 Diagnoses (n = 46)	58.8	50.4	8.4	21.8	19.2	2.6	16.3	12.7	3.6	97.4	82.9	14.5
5 Diagnoses (n = 5)	62.0	54.0	8.0	24.6	23.4	1.2	16.0	14.0	2.0	102.6	92.0	10.6
6 Diagnoses (n = 2)	74.5	70.0	4.5	32.0	34.5	-2.5	27.0	29.5	-2.5	133.5	134	-0.5

¹¹ Change no different on SD ($F_{(80)} = 1.3, p = .3, \eta^2 = .03$), IR ($F_{(80)} = .3, p = .7, \eta^2 = .01$), SR ($F_{(80)} = 1.7, p = .2, \eta^2 = .04$),

¹² Females have higher avg number of diagnoses than men ($F_{(285)} = 10.2, p < .002, \eta^2 = .04$),

¹³ Scores are different for clients with a different number of diagnoses on SD ($F_{(282)} = 5.3, p < .001, \eta^2 = .10$), IR ($F_{(282)} = 4.3, p < .001, \eta^2 = .08$), SR ($F_{(282)} = 3.2, p = .005, \eta^2 = .06$), and Total ($F_{(282)} = 5.9, p < .001, \eta^2 = .11$),

¹⁴ Change not different based on n diagnoses on SD ($F_{(273)} = .6, p = .6, \eta^2 = .01$), IR ($F_{(273)} = .5, p = .7, \eta^2 = .005$), SR ($F_{(273)} = .2, p = .9, \eta^2 = .003$), or Total Score ($F_{(273)} = .4, p = .8, \eta^2 = .004$),

Individual Diagnoses. Six predominant diagnoses were assessed to clients at admission: Mood (Anxiety / Depression), Substance Use, PTSD, Anorexia Nervosa, Binge Eating, and Bulimia. Fifty clients were assessed as 'Other', and fewer than five clients were assessed with sexual disorder, OCD, DID, ASD, and Self-harm. Only the six predominant diagnoses were used in these analyses (Table 8).

Mood Disorder. Most (262) clients were assessed with a mood disorder. Admit scores were higher for those with MD, but the amount of change was not different whether or not they had an MD¹⁵

Post Traumatic Stress Disorder (PTSD). Clients assessed with PTSD showed higher scores than those without at admission on Symptom Distress, Interpersonal Relations, and Total Score but there was no difference on Social Role. Score changes did not differ based on diagnosis of PTSD at admission¹⁶.

Substance Use. About half of the sample were assessed with Substance Use at admission. On all OQ scores, there were no differences between those assessed with substance use at admission, but on Symptom Distress, those without Substance Use improved more than those without while on all other OQ scores, there was no difference in the amount of change¹⁷.

Anorexia Nervosa. Client scores were not different based on whether they were assessed with Anorexia Nervosa on any OQ score, however on Symptom Distress and Social Role, those without Anorexia experienced more improvement than those without. This difference in amount of change was not evident for Interpersonal Relations or Total Score¹⁸.

Binge Eating. Clients assessed with Binge Eating at admission were similar to those who were not assessed with Binge Eating, and change was not different based on this indicator for any OQ scale¹⁹.

Bulimia. Clients assessed with Bulimia had higher scores than those without Bulimia on Symptom Distress, Interpersonal Relations, and OQ Total Score, but scores were similar on Social Role. The amount of change from admit to discharge was not a function of this diagnosis²⁰.

¹⁵ Clients with assessment of Mood Disorder have higher scores than those without on SD ($F_{(283)} = 14.1, p < .001, \eta^2 = .05$), IR ($F_{(283)} = 10.1, p = .002, \eta^2 = .03$), SR ($F_{(283)} = 4.7, p = .03, \eta^2 = .02$), and Total ($F_{(283)} = 14.9, p < .001, \eta^2 = .05$). Change not different based on Mood Disorder on SD ($F_{(283)} = .2, p = .6, \eta^2 = .0$), IR ($F_{(283)} = .7, p = .4, \eta^2 = .0$), SR ($F_{(283)} = 3.4, p = .06, \eta^2 = .0$), or Total ($F_{(283)} = .5, p = .5, \eta^2 = .0$).

¹⁶ Clients with assessment of PTSD have higher scores than those without on SD ($F_{(283)} = 15.7, p < .001, \eta^2 = .05$), IR ($F_{(283)} = 4.4, p = .04, \eta^2 = .02$), and Total. ($F_{(283)} = 12.3, p = .001, \eta^2 = .04$), no difference on SR ($F_{(283)} = 1.6, p = .2, \eta^2 = .01$), Change not different based on PTSD on SD ($F_{(283)} = .01, p = .9, \eta^2 = .0$), IR ($F_{(283)} = .7, p = .4, \eta^2 = .0$), SR ($F_{(283)} = 2.2, p = .1, \eta^2 = .01$), or Total ($F_{(283)} = .02, p = .9, \eta^2 = .0$).

¹⁷ No difference between clients with assessment of Substance Use and those without on SD ($F_{(283)} = .3, p = .6, \eta^2 = 0$), IR ($F_{(283)} = 3.4, p = .06, \eta^2 = .01$), SR ($F_{(283)} = 3.3, p = .07, \eta^2 = .01$), or Total. ($F_{(283)} = .2, p = .6, \eta^2 = 0$). Change was different based on Substance Use on SD ($F_{(283)} = 5.3, p = .02, \eta^2 = .02$), but not on IR ($F_{(283)} = .2, p = .6, \eta^2 = .0$), SR ($F_{(283)} = .03, p = .9, \eta^2 = 0$), or Total ($F_{(283)} = 2.7, p = .1, \eta^2 = .01$).

¹⁸ Clients with Anorexia did not have scores different than those without on SD ($F_{(283)} = 3.4, p = .07, \eta^2 = .01$), IR ($F_{(283)} = .2, p = .7, \eta^2 = 0$), SR ($F_{(283)} = .1, p = .7, \eta^2 = 0$), or Total. ($F_{(283)} = 1.1, p = .3, \eta^2 = 0$). Clients without Anorexia improved more than those without on SD ($F_{(283)} = 6.8, p = .01, \eta^2 = .02$), and SR ($F_{(283)} = 5.02, p = .03, \eta^2 = .02$), but change was not different based on Anorexia on IR ($F_{(283)} = .2, p = .6, \eta^2 = .0$) or Total ($F_{(283)} = 3.4, p = .07, \eta^2 = .01$).

¹⁹ Clients with Binge Eating did not have scores different than those without on SD ($F_{(283)} = 1.8, p = .2, \eta^2 = .01$), IR ($F_{(283)} = .8, p = .4, \eta^2 = 0$), SR ($F_{(283)} = .7, p = .4, \eta^2 = 0$), or Total. ($F_{(283)} = 1.6, p = .2, \eta^2 = .01$). There was no difference in the amount of change based on Binge Eating on SD ($F_{(283)} = 1.1, p = .3, \eta^2 = 0$), IR ($F_{(283)} = 2.0, p = .2, \eta^2 = .01$), SR ($F_{(283)} = .6, p = .4, \eta^2 = .0$) or Total ($F_{(283)} = 1.4, p = .2, \eta^2 = .01$).

²⁰ Clients with Bulimia had higher scores different than those without on SD ($F_{(283)} = 3.9, p = .05, \eta^2 = .01$), IR ($F_{(283)} = 4.1, p = .04, \eta^2 = .01$), or Total. ($F_{(283)} = 4.5, p = .04, \eta^2 = .02$), but not on SR ($F_{(283)} = 1.6, p = .2, \eta^2 = .01$). There was no difference in the amount of change based on Bulimia on SD ($F_{(283)} = .01, p = .9, \eta^2 = 0$), IR ($F_{(283)} = .01, p = .9, \eta^2 = 0$), SR ($F_{(283)} = .2, p = .7, \eta^2 = .0$) or Total ($F_{(283)} = 1.4, p = .2, \eta^2 = .01$).

Table 8. OQ Scores at Admit & Discharge with Amount of Change by Diagnosis.

	Symptom Distress			Interpersonal Relations			Social Role			OQ Total		
Clinical Benchmark	36			15			12			63		
Reliable Change Index	10			8			7			14		
	AD	DI	DIFF	AD	DI	DIFF	AD	DI	DIFF	AD	DI	DIFF
Mood Disorder (<i>n</i> = 262)	53.7	43.1	10.6	19.4	16.4	3	15.2	11.7	3.5	88.4	71.4	17
No MD (<i>n</i> = 27)	41.2	32.3	8.9	14.7	12.8	1.9	12.8	10.4	2.4	68.7	55.6	13.1
PTSD (<i>n</i> = 156)	55.9	45.6	10.3	19.8	16.6	3.2	15.3	11.9	3.4	91.2	74.3	16.9
No PTSD (<i>n</i> = 129)	48.7	38.2	10.5	18.1	15.5	2.6	14.5	11.0	3.5	81.4	64.9	16.5
Substance Use (<i>n</i> = 140)	52.1	44.0	8.1	19.8	17.0	2.8	15.5	12.2	3.3	87.5	73.4	14.1
No Subst. Use (<i>n</i> = 145)	53.2	40.6	12.6	18.3	15.1	3.2	14.4	11.0	3.4	86.1	66.9	19.2
Anorexia (<i>n</i> = 86)	55.2	47.1	8.1	18.8	16.7	2.1	14.8	12.5	2.3	89.1	76.7	12.4
No Anorexia (<i>n</i> = 199)	51.6	40.2	11.4	19.2	15.8	3.4	15.0	11.1	3.9	85.8	67.2	18.6
Binge Eating (<i>n</i> = 24)	56.7	49.6	7.1	20.3	19.1	1.2	15.8	13.2	2.6	92.8	82.0	10.8
No Binging (<i>n</i> = 261)	52.3	41.6	10.7	19.0	15.8	3.2	14.9	11.4	3.5	86.2	69.0	17.2
Bulimia (<i>n</i> = 22)	58.9	48.2	10.7	22.0	18.8	3.2	16.3	12.4	3.9	97.1	79.5	17.6
No Bulimia (<i>n</i> = 263)	52.1	41.8	10.3	18.8	15.8	3.0	14.8	11.5	3.3	85.9	69.3	16.6

Co-occurring Disorders. To understand change among clients with complex needs, we explored three pairings of diagnoses and how they affected Symptom Distress, whose clinical benchmark is 36 and RCI of 10 points. Clients with PTSD + Substance Use (SU) and those with SU improved by 8 points. Those with PTSD changed by 12, and those with neither by 13²¹. Differences in improvement were not significant overall, but slope-by-slope comparison showed that those with neither diagnosis or with just SU changed less than those with PTSD + SU ($ps < .05$). Clients with PTSD + Any Eating Disorder (ED) improved similarly overall²², but slope-by-slope comparison revealed that clients with PTSD + ED improved less (7) than all other types of clients (10-13). Clients with SU + ED improved differently overall. Those with both improved less (6) than those with only one of SU or ED (10) and from those with neither (15)²³ ($ps < .05$).

Figure 4a. Change on SD Scores at Admit & Discharge by PTSD + Substance Use

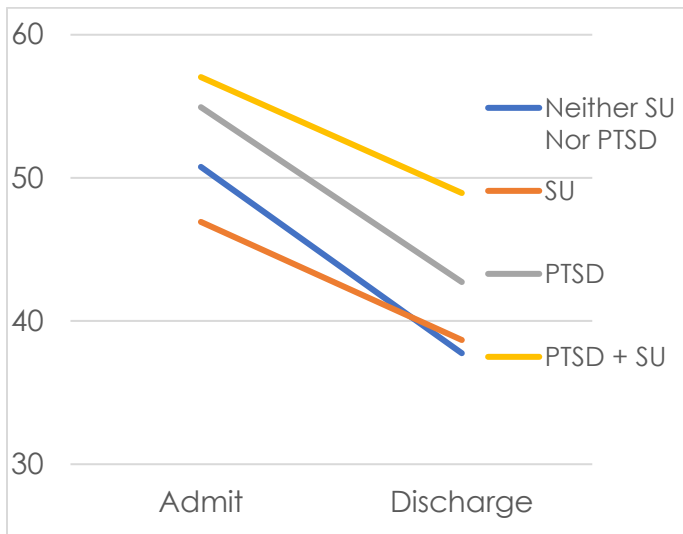


Figure 4b. Change on IR Scores at Admit & Discharge by PTSD + ED

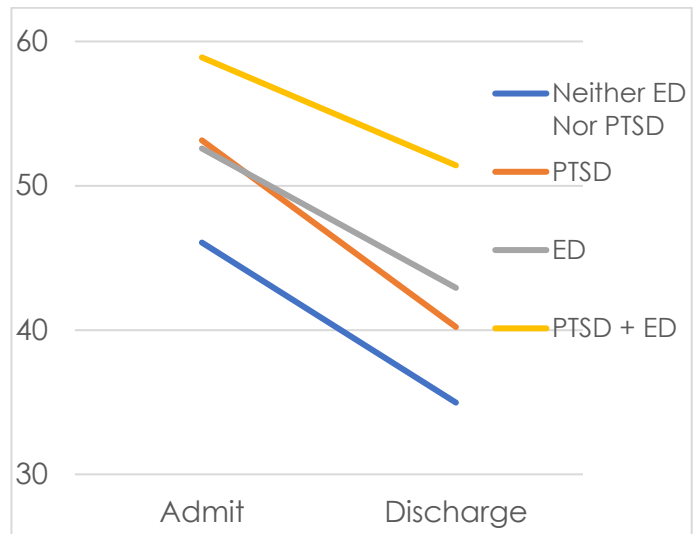
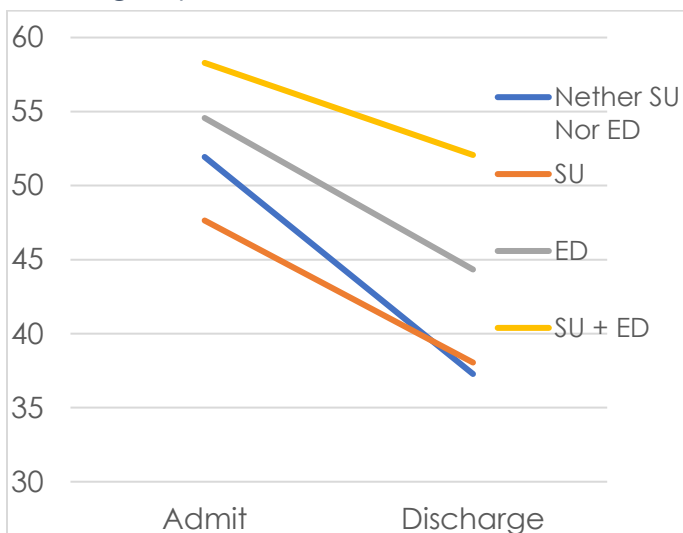


Figure 4a. Change on SD Scores at Admit & Discharge by ED + SU



²¹ Amount of change not different for different diagnoses at admit ($F_{(2,81)} = 1.8, p = .15, \eta^2 = .02$),

²² Amount of change not different for different diagnoses at admit ($F_{(2,81)} = 1.6, p = .2, \eta^2 = .02$),

²³ Amount of change different for different diagnoses at admit ($F_{(2,81)} = 3.2, p = .02, \eta^2 = .03$),

Discharge Decision. Clients may discharge from treatment based on decisions by the client, the provider, or by an external entity. Client scores at admission were similar at admission regardless of who later made the discharge decision. The overall analysis looking at difference in the amount of change was statistically significant on Symptom Distress, Interpersonal Relations, and Total Score; clients had different amounts of change across these three decision types with optimal change among those whose provider made the discharge decision and least amount of change among those whose decision was external²⁴.

Figure 5a. Change on SD Scores at Admit & Discharge by Discharge Decision

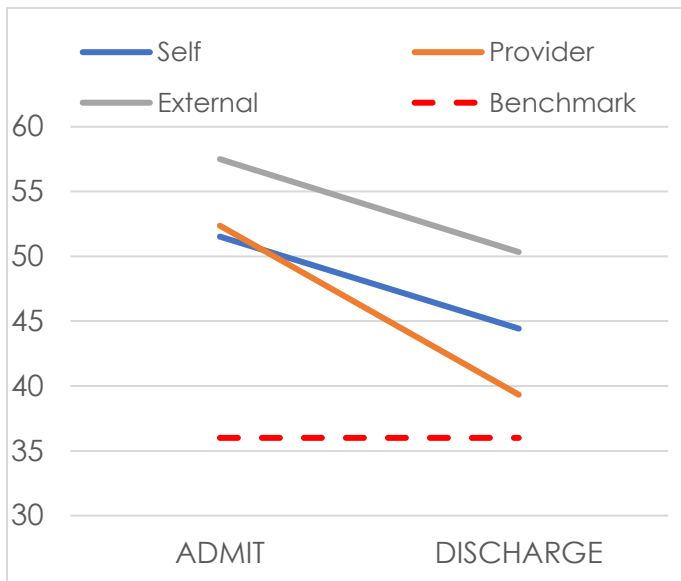


Figure 5b. Change on IR Scores at Admit & Discharge by Discharge Decision

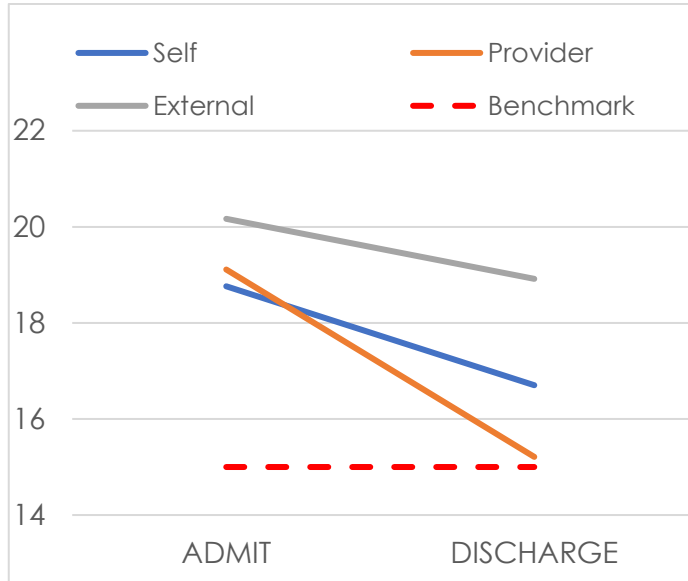


Figure 5c. Change on SR Scores at Admit & Discharge by Discharge Decision

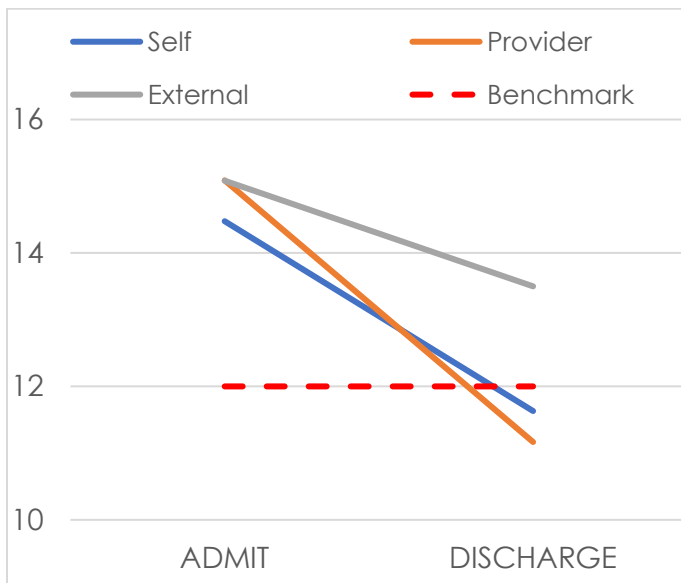
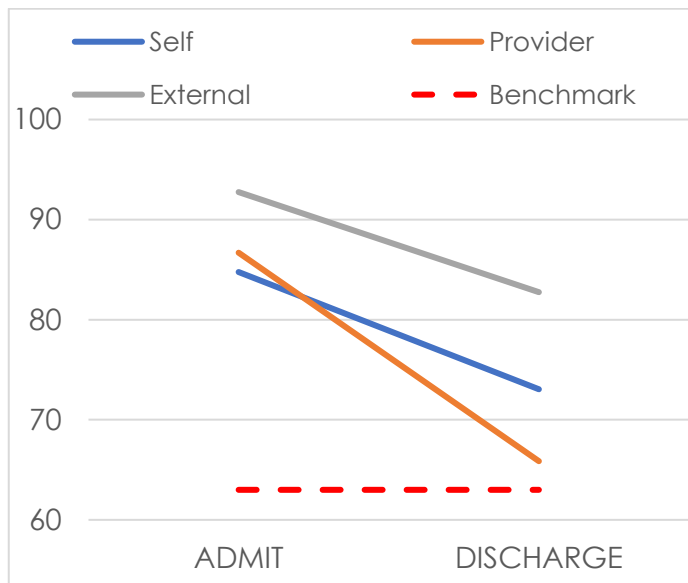


Figure 5d. Change on Total Scores at Admit & Discharge by Discharge Decision



²⁴ Scores not different at admission on SD ($F_{(273)} = .8, p = .4, \eta^2 = .01$), IR ($F_{(273)} = .2, p = .8, \eta^2 = 0$), SR ($F_{(273)} = .4, p = .6, \eta^2 = 0$), or Total. ($F_{(273)} = 0.6, p = .5, \eta^2 = 0$). Clients changed differently based on decision on SD ($F_{(273)} = 4.5, p = .01, \eta^2 = .02$), IR ($F_{(273)} = 5.02, p = .03, \eta^2 = .02$), and Total ($F_{(273)} = 4.4, p = .01, \eta^2 = .03$), but change was not different on SR ($F_{(273)} = 1.85, p = .2, \eta^2 = .01$).

Treatment Progression. Not all clients complete the full course of treatment at SunCloud. At admission, clients were not different on OQ scores based on whether they later finished. Clients who completed the program experienced more change than those who did not on all OQ Sub-Scales and Total Score²⁵.

Figure 6a. Change on SD Scores at Admit & Discharge by Treatment Completion

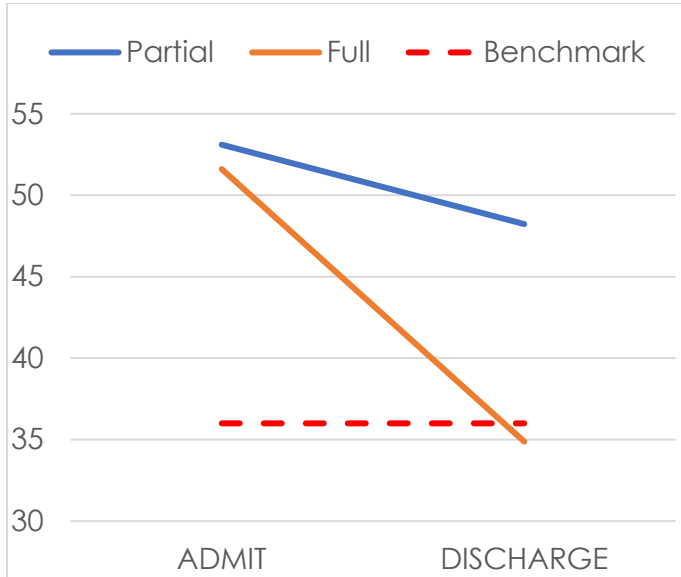


Figure 6b. Change on IR Scores at Admit & Discharge by Treatment Completion

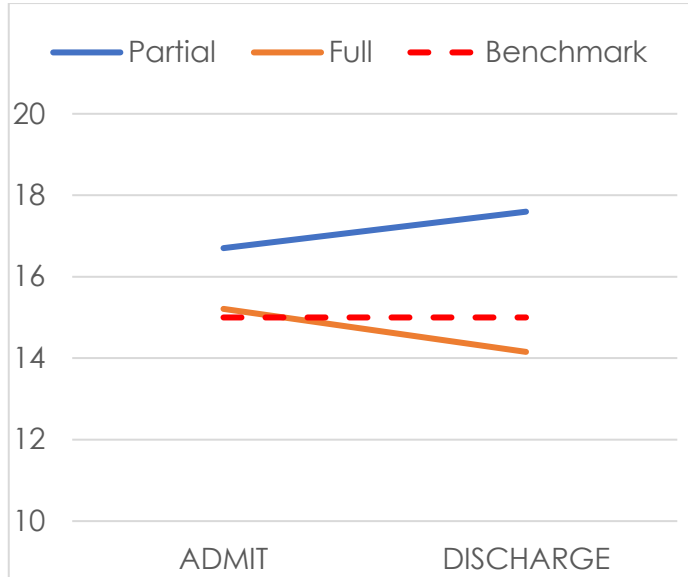


Figure 6c. Change on SR Scores at Admit & Discharge by Treatment Completion

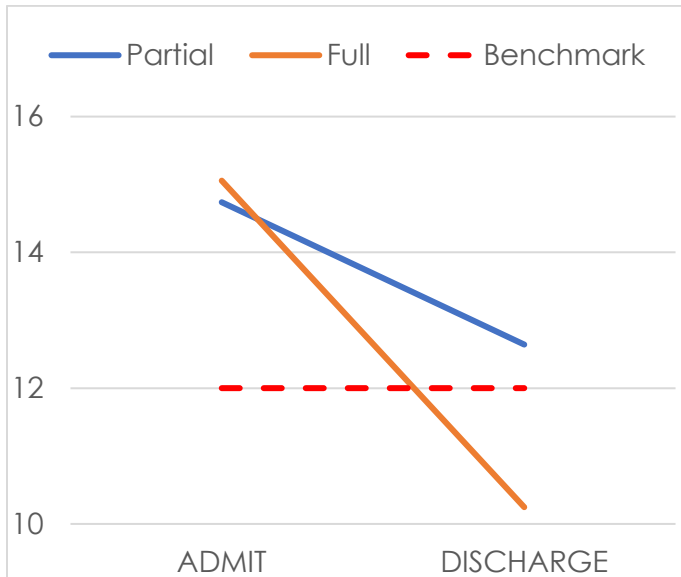
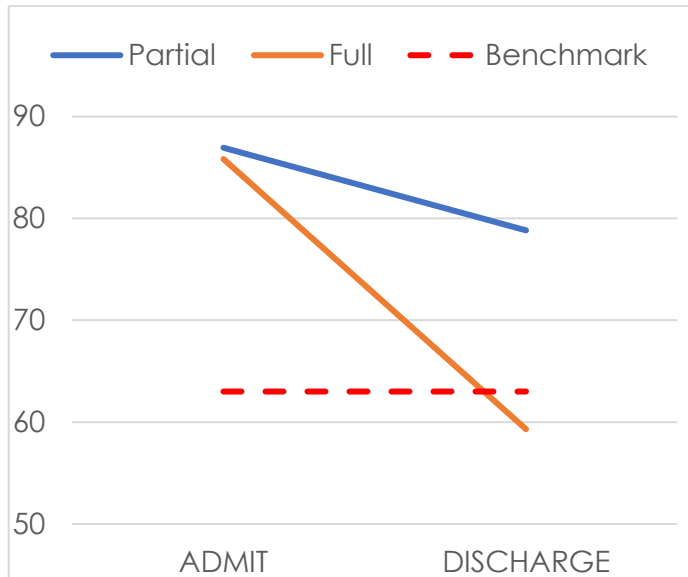


Figure 6d. Change on Total Scores at Admit & Discharge by Treatment Completion



²⁵ Clients did not differ on admission scores based on later completion on SD ($F_{(274)} = .6, p = .4, \eta^2 = 0$), IR ($F_{(274)} = .1, p = .8, \eta^2 = 0$), SR ($F_{(274)} = .3, p = .6, \eta^2 = 0$) or Total. ($F_{(274)} = .1, p = .7, \eta^2 = 0$). Amount of change differed based on completion on SD ($F_{(274)} = 44.8, p < .001, \eta^2 = .14$), IR ($F_{(274)} = 25.7, p < .001, \eta^2 = .09$), SR ($F_{(274)} = 17.7, p < .001, \eta^2 = .06$) or Total ($F_{(274)} = 42.3, p < .001, \eta^2 = .13$).

Regression Analysis. The last analysis puts all influencing factors into an equation to determine two things: overall strength of the 'model' to determine the amount of variability in the outcome that can be attributed to all predictors. Secondly, it examines the amount of variability in the outcome that can be attributed to each predictive factor, controlling for the other factors. In other words, we can see the amount of unique contribution of each predictor to the outcome, partialling out the contribution of the other factors.

In this case, our outcome will be the amount of change from admit to discharge on each of the subscales and the Total Score for the OQ. The predictors are admission age and year, program, treatment progression, discharge decision, subjective risk, and the six predominant mental health diagnoses assessed at admission.

It should be noted that results from this multiple-predictor analysis might differ from analyses in the rest of the report, each of which only accounted for one factor at a time. This is due to the ability of the regression procedure to hold other factors constant for each predictor.

On **Symptom Distress**, the overall model was significant ($F_{(12,270)} = 6.3, p < .001, R^2 = .19$); 19% of the variability on Symptom Distress can be predicted by this combination of factors. Program completion had the most (8%) unique influence on the outcome; we can estimate improvement of 11.8 points more on Symptom Distress for completers compared to non-completers, when all other variables are held constant. Substance use was also one of the more important predictors, with 3% unique contribution to R^2 . This unique contribution can be seen in Table 9 under Sq. Partial. **B** represents the amount of change estimated based on any one unit increase in the predictor variable. For example, for every one year older at admit, there is an estimated .18 more on Symptom Distress change scores. **St. Beta** standardizes the *B*, so for example, we would know that the .18 *B* for age is 0.14 Standard Deviations. The **p** indicates whether the contribution of each predictor is statistically significant.

On **Interpersonal Relations**, the overall model was significant ($F_{(12,270)} = 3.3, p < .001, R^2 = .09$); 10% of the change scores can be attributed to the group of predictors. Treatment completion had the most unique contribution to R^2 (4%).

On **Social Role**, the model was significant ($F_{(12,270)} = 3.1, p < .001, R^2 = .09$); 9% of the variability on Social Role can be attributed to the model. Three of the predictors had 2% unique contribution to R^2 : Program Type, Completion, and diagnosis of Anorexia Nervosa.

On the **OQ Total Score**, the model was significant ($F_{(12,270)} = 5.8, p < .001, R^2 = .18$); 18% of the variability on the outcome can be attributed to the predictors. Treatment completion contributed 7% to the R^2 , translating to an estimated 17.6 point difference in decreased change score for completers versus non-completers. Each indicator of age, treatment program, diagnosis of anorexia nervosa and diagnosis of substance use contributed 2%.

Table 9. OQ Change Scores Predicted by Multiple Client and Treatment Factors.

		B	St. Err	St. Beta	t	p	Partial	Sq. Partial
SYMPTOM DISTRESS	Admit Age	0.18	0.07	0.14	2.44	0.02	0.15	0.02
	Admit Year	3.13	1.93	0.10	1.62	0.11	0.10	0.01
	PHP / IOP	4.47	2.54	0.12	1.76	0.08	0.11	0.01
	Completion	-11.82	2.56	-0.37	-4.62	0.00	-0.28	0.08
	Disch Decision	3.07	2.02	0.10	1.52	0.13	0.09	0.01
	Subj Risk	-3.16	1.80	-0.11	-1.75	0.08	-0.11	0.01
	Binge Eating	3.97	3.23	0.07	1.23	0.22	0.08	0.01
	Bulimia	2.35	3.37	0.04	0.70	0.49	0.04	0.00
	PTSD	0.50	1.79	0.02	0.28	0.78	0.02	0.00
	Anorexia N.	3.90	2.01	0.11	1.94	0.05	0.12	0.01
	Substance Use	5.76	1.96	0.18	2.95	0.00	0.18	0.03
Mood Disorder	-4.72	3.26	-0.08	-1.45	0.15	-0.09	0.01	
INTERPERSONAL RELATIONS	Admit Age	-.005	.002	-.120	-2.021	.044	-.125	0.02
	Admit Year	-.038	.062	-.038	-.613	.541	-.038	0.00
	PHP / IOP	-.077	.082	-.069	-.940	.348	-.058	0.00
	Completion	.258	.083	.267	3.114	.002	.190	0.04
	Disch Decision	-.030	.065	-.033	-.461	.645	-.029	0.00
	Subj Risk	-.018	.058	-.019	-.301	.764	-.019	0.00
	Binge Eating	-.075	.105	-.043	-.719	.473	-.045	0.00
	Bulimia	-.089	.109	-.049	-.820	.413	-.051	0.00
	PTSD	.105	.058	.109	1.822	.070	.113	0.01
	Anorexia N.	-.071	.065	-.067	-1.093	.276	-.068	0.00
	Substance Use	-.050	.063	-.052	-.792	.429	-.049	0.00
Mood Disorder	.168	.106	.095	1.595	.112	.099	0.01	
SOCIAL ROLE	Admit Age	.047	.027	.104	1.754	.081	.109	0.01
	Admit Year	.105	.717	.009	.147	.883	.009	0.00
	PHP / IOP	2.245	.943	.175	2.379	.018	.147	0.02
	Completion	-2.229	.951	-.201	-2.344	.020	-.144	0.02
	Disch Decision	.977	.751	.093	1.302	.194	.081	0.01
	Subj Risk	-.199	.669	-.019	-.298	.766	-.019	0.00
	Binge Eating	1.438	1.201	.072	1.197	.232	.074	0.01
	Bulimia	-.072	1.253	-.003	-.057	.954	-.004	0.00
	PTSD	-.168	.664	-.015	-.252	.801	-.016	0.00
	Anorexia N.	1.550	.747	.128	2.074	.039	.128	0.02
	Substance Use	.157	.726	.014	.216	.830	.013	0.00
Mood Disorder	-2.245	1.211	-.111	-1.854	.065	-.115	0.01	
OQ TOTAL SCORE	Admit Age	.265	.117	.127	2.252	.025	.139	0.02
	Admit Year	4.013	3.115	.077	1.288	.199	.080	0.01
	PHP / IOP	8.223	4.097	.140	2.007	.046	.124	0.02
	Completion	-17.636	4.130	-.348	-4.270	.000	-.257	0.07
	Disch Decision	4.844	3.260	.101	1.486	.138	.092	0.01
	Subj Risk	-3.929	2.906	-.082	-1.352	.177	-.084	0.01
	Binge Eating	7.435	5.216	.082	1.425	.155	.088	0.01
	Bulimia	3.060	5.443	.032	.562	.574	.035	0.00
	PTSD	-.692	2.884	-.014	-.240	.811	-.015	0.00
	Anorexia N.	6.849	3.245	.124	2.111	.036	.130	0.02
	Substance Use	6.788	3.155	.134	2.152	.032	.133	0.02
Mood Disorder	-9.071	5.261	-.098	-1.724	.086	-.107	0.01	

Post-Treatment. Data at SunCloud is collected from clients at 1-month, 6-months, and 1-year after discharge to determine whether treatment gains are sustained after departure. Data collection after treatment is always difficult however, SunCloud has endeavored to engage in this process to be accountable to clients, families, staff, and other stakeholders. That said, there were fewer data post-treatment than for admit and discharge and so we looked at all clients (not just those with matched admit and discharge contribution) at 6-months ($n = 49$) and 1-year ($n = 21$) after treatment.

Table 10 details matched pre- and post-treatment scores for the sample examined in the rest of this report and are in **black** print. The Post-Treatment data are in **blue** and although some of the clients may be from the sample in the rest of the report, some may not. As such, this is not a measure of change over time, but a snapshot of how a group of post-SunCloud clients scored at the given duration after treatment.

The results are promising. The post-treatment scores are similar to the discharge scores at 6-months and again at 1-year. This cross-sectional analysis suggests that treatment gains made at SunCloud are likely maintained after treatment for up to a year.

Table 10. Average OQ Total and Sub-Scale Scores for All SunCloud Clients Pre-to Post-Treatment

	Symptom Distress	Interpersonal Relations	Social Role	OQ Total
Clinical Benchmark	36	15	12	63
Reliable Change Index (RCI)	10	8	7	14
Pre-Treatment	52.6	19.1	15.0	86.7
Post-Treatment	42.2	16.1	11.6	70.0
6-Months Post-Treatment	43.3	14.9	11.3	69.4
1-Year Post-Treatment	42.0	16.1	11.1	69.2