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## OnTrack: A Program Evaluation

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OnTrack: A Program Evaluation

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## Table of Contents

Abstract . . . . .	4
Introduction. . . . .	5
Background of OnTrack . . . . .	6
Problem Statement . . . . .	7
Purpose of Project . . . . .	8
Clinical Question . . . . .	8
Review of the Literature . . . . .	9
Conceptual and Theoretical Framework . . . . .	11
Project Design . . . . .	11
Method. . . . .	12
Sample Selection . . . . .	12
Significance and/or Implications . . . . .	13
Data Collection and Analysis . . . . .	13
Results . . . . .	14
Discussion . . . . .	27
Conclusion . . . . .	32
References . . . . .	33
Appendices. . . . .	36
Appendix A- Compliance to Scheduled Mediation Appointments . . . . .	36
Appendix B- Crisis Calls and/or Assessments. . . . .	38
Appendix C-Suicide Attempts. . . . .	42
Appendix D-Inpatient Hospitalization Days. . . . .	43

Appendix E-IPS.....46

Appendix F-MIRECC GAF Score.....47

### Abstract

OnTrack is a program that provides coordinated specialty care (CSC) services for patients who have experienced their first episode of psychosis (FEP). Appropriately identifying and aggressively treating this vulnerable population, while providing support to both them and their families is critical for improved outcomes. Appropriate treatment of FEP patients can improve their quality of life, preserve brain matter, improve overall functioning, and lessen the burden of the clients' family who may be involved in their care, such as caregiver strain or financial hardship. The purpose of this project is to evaluate the success of OnTrack, a FEP program, at improving health outcomes for enrolled patients who have just experienced their first psychotic episode. The following variables will be tracked and analyzed for changes denoting improvement in the patients' health status: the patient's level of compliance with keeping scheduled medication appointments, number of crisis calls, number of suicide attempts, total number of inpatient hospitalization days, gainful employment status, and overall quality of life as measured by scores on the Mental Illness Research, Education, and Clinical Center (MIRECC) version of the global assessment of functioning (GAF).

Retrospective chart reviews were conducted to obtain the variable data. Successful outcomes were defined as keeping 75% of scheduled medication appointments, a reduction in the total number of crisis calls, avoiding suicide attempts, reducing inpatient hospitalization days by 90%, maintain gainful employment consecutively for 90 days with 10% of the enrolled patients, and improve MIRECC GAF scores in 60% of patients enrolled in OnTrack. This program evaluation demonstrated that OnTrack was successful at meeting or exceeding the benchmarks in five of the six outcome variables.

## OnTrack: A Program Evaluation

### **Introduction**

Empirical evidence demonstrates that the deleterious effects of psychotic illness on social and cognitive functioning are most dramatic within the first five years from the emergence of psychotic symptoms (Dixon, et al., 2015). Early and aggressive interventions such as psychotropic medications, therapy services, case management services, specifically CSC services, peer support, and psychoeducation are critical when treating individuals who have just experienced their first psychotic episode. Studies have demonstrated that shorter durations of untreated psychosis is associated with improved patient outcomes such as improved control of psychotic symptoms (Dixon, et al., 2015).

Research demonstrates that individuals who go on to be diagnosed with schizophrenia are more often non-compliant with recommended mental health services such as taking psychotropic medications as prescribed (Pennington & McCrone, 2018). Non-compliance with therapy and prescribed psychotropic medications increases the likelihood of a relapse in psychotic symptoms and involuntary inpatient hospitalizations, thus lowering the patient's baseline level of functioning with each reoccurring psychotic episode (Pennington & McCrone, 2018). Compliance to medication appointments and prescribed medications are vital as times to remission are longer for each subsequent psychotic episode and future effective dosages of antipsychotics are typically higher (Fusar-Poli, McGorry, & Kane, 2017). Research suggests that individuals who develop a chronic disease such as schizophrenia are faced with many challenges on a daily basis and need all available supportive services.

One such service is CSC, which is a coordinated, team-based and multi-faceted approach, aimed at fostering recovery and preventing disability when treating individuals with FEP

(Heinssen, Goldstein, & Azrin, 2014). CSC is a collaborative and recovery-oriented approach involving the patient, the treatment team members, and relatives who are involved in the care of the identified patient, thus making CSC services primarily intended for adolescents and young adults who have experienced a FEP.

### **Background of OnTrack**

OnTrack, is a FEP clinic that utilizes CSC services designed to bridge existing services for FEP patients and eliminate gaps between child, adolescent, and adult mental health services or programs (Heinssen, Goldstein, & Azrin, 2014). Components of OnTrack are designed to meet the needs of a patient experiencing FEP and include assertive case management, individual and family psychotherapy, monthly family psychoeducation, supported employment and educational services (SEES) utilizing the individual placement support (IPS) model, peer support, and medication management with antipsychotics.

A master level clinician, or therapist, is the team leader of OnTrack who oversees all aspects of the treatment team. The master level clinician works with the patient and family to identify treatment goals and develop treatment plans to address the identified goals. The therapist works individually with the patient to discuss any concerns regarding their current status or treatment, helps identify strategies to address any potential issues that may arise, and practices these tools in a safe and controlled environment. The SEES specialist works with the patient to identify and clarify educational and/or employment goals and assists with identifying beneficial resources for achieving these goals, such as gaining employment. The case manager assists the patient in finding community resources to improve daily life, and practices independent activities of daily living with the patient to help gain independence. The peer support specialist role is an intimate one as this individual has had first-hand experience with emotional and/or substance

abuse, and they have actively engaged in treatment themselves. Lastly, the patient is seen for medication services, by the psychiatrist or psychiatric nurse practitioner on staff who monitors and adjusts the patient's psychotropic medications accordingly.

### **Problem Statement**

Schizophrenia affects 1% of the United States population (Sadock, Sadock, Ruiz, & Kaplan, 2015). Schizophrenia is the 11<sup>th</sup> leading cause of disability worldwide (Fusar-Poli, McGorry, & Kane, 2017). The onset of schizophrenia is rare, with approximately 100,000 adolescents and young adults in the United States experiencing their first psychotic episode each year, however the prevalence rate of schizophrenia among adolescents between the age of 13 and 18 years of age is estimated to be 0.23%. (Petruzzelli et al., 2018). In 2013, the worldwide prevalence rate of schizophrenia was 23.6 million cases (Fusar-Poli, McGorry, & Kane, 2017).

Schizophrenia is challenging to effectively treat and minimize symptom progression the further the patient is into the disease trajectory (Sadock, Sadock, Ruiz, & Kaplan, 2015). Research has shown that individuals who are diagnosed with schizophrenia are more often non-compliant with recommended mental health services, are more likely to abuse alcohol and/or illegal substances, more likely to be arrested, are hospitalized more frequently, have an increased likelihood to commit suicide, and die on average 25 years below the average lifespan (Sadock et al., 2015).

Interventions such as CSC services have been shown to be helpful in the management of persons who have experienced their first psychotic episode and may go on to be diagnosed with a chronic and debilitating disease such as schizophrenia (Heinssen, Goldstein, & Azrin, 2014). The implementation of FEP programs targeting early intervention may prove beneficial in this



particular patient population. One such program is OnTrack, which is a two-year program that employs CSC services to individuals who have just suffered from their first psychotic episode.

### **Purpose of the Project**

The purpose of this program evaluation is to analyze identified outcome variables of patients enrolled in OnTrack to determine if there is improvement in patient outcomes. OnTrack seeks to accomplish the following: increase compliance with scheduled medication appointments, minimize crisis calls and/or assessments, decrease and avoid suicidal behaviors such as suicide attempts, decrease total inpatient hospitalization days, maintain gainful employment, and improve the patient's overall quality of life as measured by the MIRECC GAF scores.

### **Clinical Question**

Do CSC services offered by OnTrack increase compliance with scheduled medication appointments, decrease crisis calls and/or assessments, decrease and avoid suicide attempts, decrease inpatient hospitalization days, increase employment status, and improve quality of life as measured by MIRECC GAF scores?

Several benchmarks have been identified in order to determine if OnTrack has been successful at improving patient outcomes. Research has shown that no-show rates for medication appointments are as high as 33% in outpatient community mental health setting (Molfenter, 2013). However, success is defined as keeping 75% of their scheduled medication appointments. In regard to suicidal behaviors, OnTrack aims to prevent suicide attempts altogether, and research has shown that early psychosis intervention (EPI) programs such as OnTrack demonstrate reductions in suicide rates (Chan et al., 2018). If there is a history of suicidal behaviors or attempts, then the timeframe of their admission will be compared to that same

timeframe prior to admission and measure for improving or worsening suicidal behaviors or any suicide attempts since being enrolled in OnTrack. The same benchmarks will be measured for crisis calls and/or crisis assessments as well. For instance, if the patient has been enrolled in OnTrack for six months, the researcher will go back and look at the previous six months of patient history looking specifically at crisis calls, total inpatient hospitalizations, and total inpatient hospitalization days prior to being enrolled in OnTrack. The state of Tennessee has set the benchmark of the individual having a 90% reduction of days spent in a psychiatric hospital following admission to the OnTrack program. Also, the state of Tennessee requires that a minimum of 10% of patients enrolled in the IPS program maintain gainful employment for at least 90 consecutive days. Lastly, the MIRECC GAF scale, which is measured every three months, should show improvements in total scores in at least 60% of the enrolled patients as well.

### **Review of the Literature**

Little is known about the cause of Schizophrenia, but the onset is usually between 18 and 35 years of age (Mueser & Cook, 2014). Schizophrenia is a chronic, lifelong debilitating illness that is characterized by periods of relapse that requires intensive treatment (Pennington & McCrone, 2017). Research has demonstrated that delayed treatment from a first episode of psychosis leads to greater neurobiological and psychosocial impairment, and greater difficulty with future symptom stabilization (Mueser & Cook, 2014). Most individuals do not receive their first contact with a mental health professional on average 74 weeks after the onset of psychotic symptoms (Mueser & Cook, 2014). Longer duration of untreated psychosis and a higher degree of illness severity at the time of FEP are both risk factors directly related to functional deterioration (Rey-Mejias et al., 2015). Studies have suggested that psychosis of adolescent onset

(before the age of 18) is associated with longer duration of untreated psychosis and poorer premorbid functioning both socially and academically, compared to adult onset psychosis (Joa et al., 2009). Patients with an earlier onset of psychosis report more depressive symptoms and have a higher rate of suicide attempts and suicidal ideations over their lifetime (Joa et al., 2009).

The toll that schizophrenia takes on individuals, their families, and the healthcare system is enormous. The negative symptomatology associated with schizophrenia has been demonstrated as the most relevant predictor of increased future socio-occupational dysfunction and poorer quality of life (Mezquida, et al., 2017). The estimated direct and indirect costs of treating schizophrenia in the United States in 2013 was 155 billion dollars, or nearly \$45,000 per individual (Carroll, “RESEARCH WEEKLY: The High Cost of Schizophrenia”). The lifetime cost of schizophrenia is estimated to be around one million dollars per person (Pennington & McCrone, 2017).

OnTrack utilizes IPS, which is an evidence-based model of supported employment for people living with serious and persistent mental illness (SPMI). Among patients with FEP, the level of unemployment can range from 40-50%, whereas peers without psychosis at similar ages have an unemployment rate of 3.5-4.5% (Killackey et al., 2013). Research has demonstrated that competitive employment has positive impacts on self-esteem, life satisfaction, and decreased symptomatology (Lucian, Bond, & Drake, 2014). A meta-analysis of 17 randomized controlled trials found that patients receiving IPS services were 2.4 times more likely to be employed than controls (Modini, Joyce, Mykletun, Christensen, Bryant, Mitchell, & Harvey, 2016).

Unemployment is a primary psychosocial disability for individuals with psychotic disorders such as schizophrenia, and this also limits the degree to which one can participate in society (Killackey et al., 2013). There is a growing body of literature that displays the impact on patient

outcomes of early intervention from FEP clinics in improving symptoms, increasing employment status, and restoring adaptive functioning in a manner that is superior to treatment as usual.

(Heinssen, Goldstein, & Azrin, 2014).

### **Conceptual and Theoretical Framework**

The Quality Enhancement Research Initiative (QUERI) model is the framework that guided this OnTrack program evaluation. The QUERI model was developed by the Veterans Affairs (VA) in 1998 in order to improve the performance of the VAs healthcare system and quality of care (Stetler et al., 2006). The mission of the VAs QUERI is to implement clinical research findings into routine care (Stetler et al., 2006). By using the QUERI model, the intersection of research and practice can be highlighted to show that translational research is accomplished through clinical and quality improvement activities (White, Dudley-Brown, & Terhaar, 2016).

There are six steps used in the QUERI model to guide disseminating research into routine care (Stetler et al., 2006). The steps are: identifying a high-risk diagnosis, identifying recommended services or evidenced-based practices, measuring quality and performance gaps, implementing improving programs, evaluating the improvement programs, and assessing the feasibility of implementing this into practice (White, Dudley-Brown, & Terhaar, 2016). Using the QUERI model to guide this program evaluation assists the researcher in measuring quality and performance gaps within the OnTrack program to further enable targeted areas for improving service delivery.

### **Project Design**

This project was designed as a formative program evaluation of the OnTrack program in an FEP clinic that employs CSC services as data will be provided for improvements of the

OnTrack program in order to better prepare the program to meet expected outcomes. By using a formative evaluation, related data collection occurred before, during, and after implementation of CSC services. This program evaluation is also considered a summative evaluation to determine whether an intervention such as CSC is effective. Finally, this program evaluation is considered an outcomes-based evaluation as the researcher collected, measured, and analyzed the aforementioned outcome variables to determine if there have been improved outcomes in the identified variables.

### **Method**

The success of OnTrack was determined through several benchmarks such as compliance with scheduled medications appointments, number of crisis calls, number of inpatient hospitalization days, suicide attempts, maintaining gainful employment, and patients' scores on the MIRECC GAF. Retrospective chart reviews were conducted to collect relevant data to evaluate the outcome variables. By measuring outcome data, the study determines if the services offered by OnTrack are efficacious in treating individuals who have just suffered from FEP. Conducting retrospective chart reviews highlights areas of strengths and areas of needed improvement within the OnTrack program which can be taken into consideration for future implementation of FEP or EPI clinics.

### **Sample Selection**

OnTrack is a program that is part of a non-profit community mental health center (CMHC) located in East Tennessee. The CMHC has outpatient clinics in over 10 counties in Eastern Tennessee and serves over 25,000 patients annually. Patients were randomly identified through chart reviews and assigned identification numbers during the data collection process as there was no need to identify any patients by name for this program evaluation. There were 20

patients identified, but one patient was excluded from the evaluation, so only 19 patients were included in the data collection process. The data was then input on an Excel spreadsheet. The spreadsheet of information is secured on a password protected hard drive. Patients included in the program evaluation of OnTrack were individuals between the ages of 15 and 30 years old who are residents of Knox County, TN. The identified patients have suffered from their first psychotic episode and their symptoms have been present for at least one week but less than two years. Patients that are excluded from OnTrack are individuals who have a substance induced psychotic disorder, have an IQ below 70, who have been diagnosed on the Autism Spectrum scale, and live outside of the Knox County area.

### **Significance and/or Implications**

Evaluation of the OnTrack program will enable evidence-based quality improvement in care delivery within this complex population. Identifying ways to increase compliance with scheduled medication appointments, minimize inpatient hospitalization days, prevent suicide attempts, maintain gainful employment, and increase the patient's overall quality of life adds to the current body of knowledge for treating individuals who have just suffered their first psychotic episode. The OnTrack program evaluation will also help mental health clinicians identify any trends or changes across time after receiving services through FEP or EPI programs such as OnTrack.

### **Data Collection and Analysis**

The data was analyzed to determine whether there were improvements in each patients' time of admission up to three months following the onset of the program evaluation. Outcome measures included improved compliance with scheduled medication appointments, decreased crisis calls, no suicide attempts, decreased total inpatient admissions but reduce hospitalization

days by 90%, maintaining vocational placement with 10% of the enrolled patients for 90 consecutive days, and improved overall quality of life as measured by the MIRECC GAF scale.

The MIRECC GAF Scale has been shown to be scored reliably and possessed predictive validity (Niv, Cohen, Sullivan, & Young, 2007). Strengths of this project show where OnTrack, or other EPI programs, are most efficacious and where the programs may be lacking. By identifying these specific areas, further research can be conducted into determining what can be done to further enhance services that are provided.

Data collection was conducted over three months and concluded in June 2019. During these three months, relevant or benchmark data was collected from prior to the patient's admission, then collected from the patient's time of admission, and there was ongoing data collection up until the end of June 2019. The data was then used to evaluate the OnTrack program by analyzing the aforementioned outcome variables. From August 2019 through December 2019, data will be analyzed, and the findings disseminated.

### **Results**

Statistical Package for the Social Sciences (SPSS) was utilized to analyze the data for the aforementioned outcome variables. The data was analyzed using two approaches. First, the descriptive information was obtained and is presented in the following sections, which includes relevant percentiles, means, and standard deviations. Second, pre and post data was analyzed using Paired Sample t test, as this compares the means before and after admission into the OnTrack program to determine if the mean differences among the chosen variables is significantly different than zero. An alpha level of 0.05 was chosen. Further, effect sizes were used to quantify the magnitude of measured mean differences between pre and post data.

**Variable 1-Adherence to Scheduled Medication Appointments**

The collected data shows that the percentage of adherence to scheduled medication appointments was 75% for all patients who were enrolled in the OnTrack program. Table 1B shows the median percentage was 77% while the mode was 80%. The descriptive statistics in Table 1A shows the minimum compliance rate was 50% while the maximum was 100%. Of the enrolled patients, 53% had a compliance rate of 75% or higher, which was the benchmark used to determine if OnTrack was successful at increasing compliance with scheduled medication appointments. The percentage of keeping scheduled medication appointments of the three patients who completed OnTrack was 83%. Table 1C shows the results from a one-sample t-test, which was utilized to determine if this mean was significantly higher than expected and shows a t-value of 20.7 with a lower confidence interval of 67.3% and upper confidence interval of 82.5%.

**Table 1A**

		Descriptive Statistics of Compliance			
Variable	N	Minimum	Maximum	Mean	Std. Deviation
Compliance	19	50.00	100.00	74.94%	15.78844

**Table 1B Statistics of Compliance**

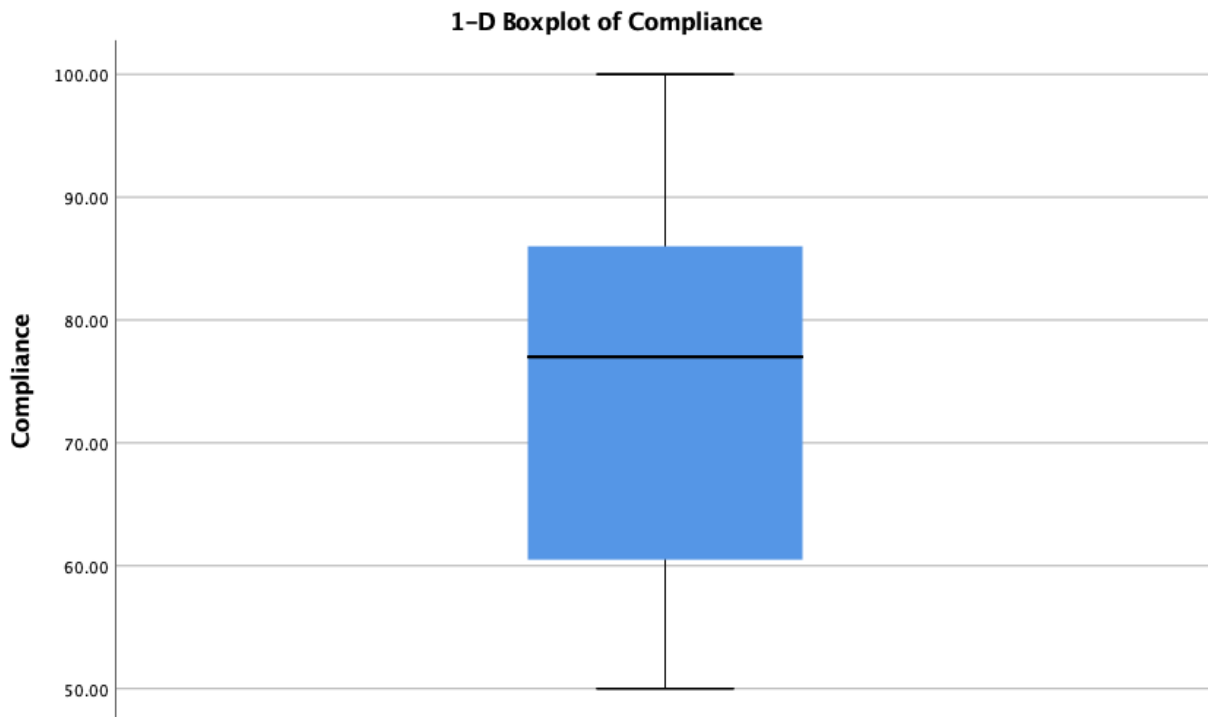
Compliance			
N	Valid	19	
	Missing	0	
Mean			74.9474
Median			77.0000
Mode			80.00



**Table 1C** *One-Sample Test*  
*Test Value=0*

	T	Sig. (2-tailed)	Mean	95% Confidence Interval of the Difference	
				Lower	Upper
<i>Compliance</i>	20.692	0.00	74.94	67.33	82.55

**Graph 1a**

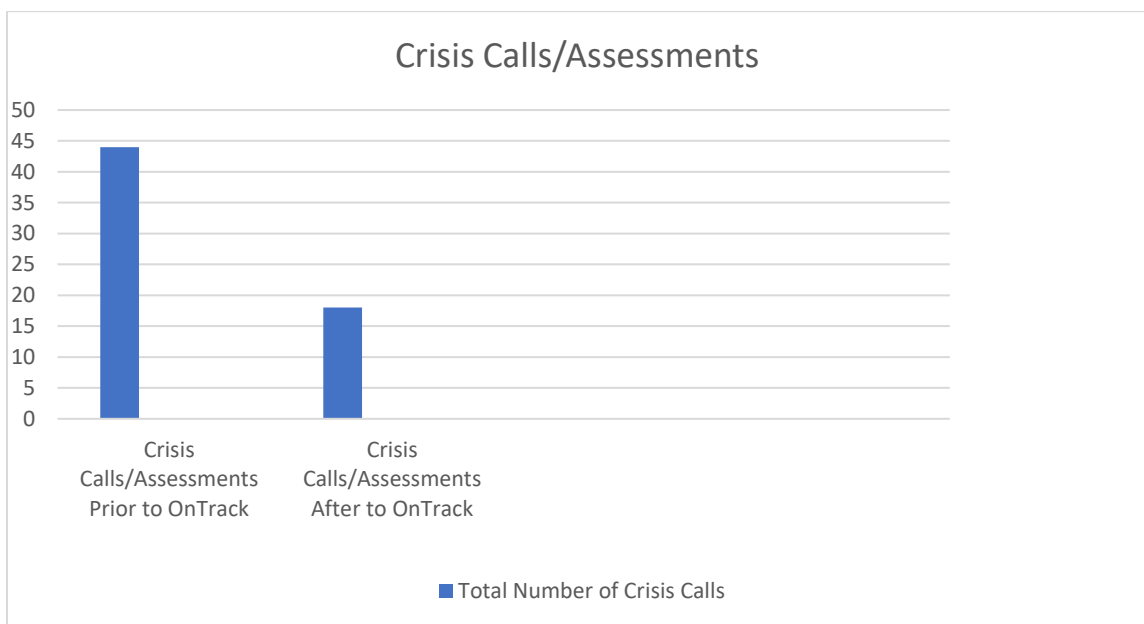


**Variable 2-Crisis Calls and/or Assessments**

Crisis calls and/or crisis assessments was the next variable that was measured using SPSS. When looking at this specific variable, the timeframe of their admission into OnTrack was compared to the same timeframe prior to their admission to OnTrack. For example, if a patient had been enrolled in OnTrack for six months, the investigator examined six months of data prior to OnTrack enrollment in order to compare outcomes. Table 2B shows the sum, or total number of crisis calls and/or assessments made for all patients prior to being enrolled in OnTrack was 44.

The total number of crisis calls and/or assessments decreased to 18 once admitted to the OnTrack program, which is displayed in Table 2D as well as Graph 2a. Tables 2C and 2E display the frequency of crisis calls pre and post admission into OnTrack. The mean crisis calls/assessment per patient was 2.3 prior to their admission while it was measured at 0.95 post admission to OnTrack. Table 2A displays results from a paired sample t test which demonstrates a significant difference in number of crisis calls/assessments before and after OnTrack  $t(18)=2.216, p=.040$ .

**Graph 2a**



**Table 2A**

***Paired Sample Test***

***Paired Differences***

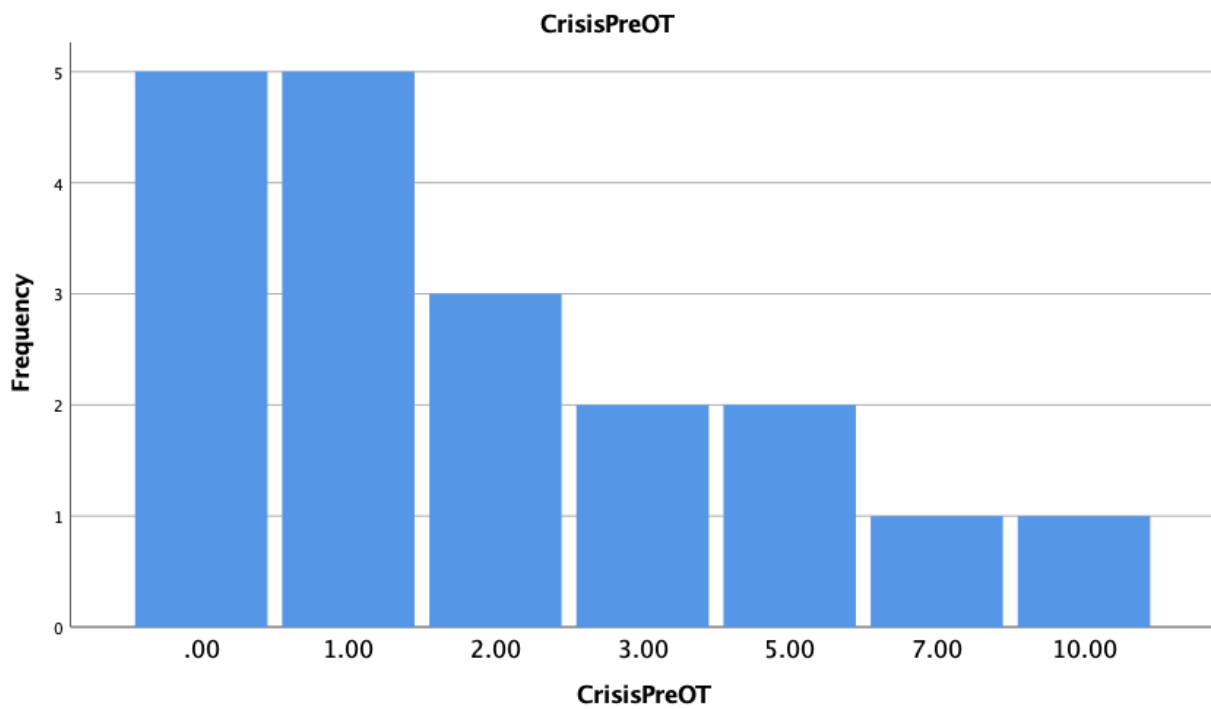
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	Sig. (2-tailed)
<i>Pair 1</i>				Lower	Upper		
<i>Crisis Pre OnTrack-Crisis Post OnTrack</i>	1.36842	2.69177	0.61753	0.07103	2.66581	2.216	0.040

**Table 2B**

***Crisis Calls and/or Assessments Prior to OnTrack Admission***

<i>N</i>	Valid	19
	Missing	0
<i>Mean</i>		2.3158
<i>Sum</i>		44.00

**Graph2b**



**Table 2C**

***Crisis Calls and/or Assessments Prior to OnTrack Admission***

	Frequency	Percent	Valid Percent	Cumulative Percent
<i>Valid</i>				
.00	5	26.3	26.3	26.3
1.00	5	26.3	26.3	52.6
2.00	3	15.8	15.8	68.4
3.00	2	10.5	15.8	78.9
5.00	2	10.5	10.5	89.5
7.00	1	5.3	5.3	94.7
10.00	1	5.3	5.3	100.00
<i>Total</i>	19	100.00	100.00	

**Table 2D**

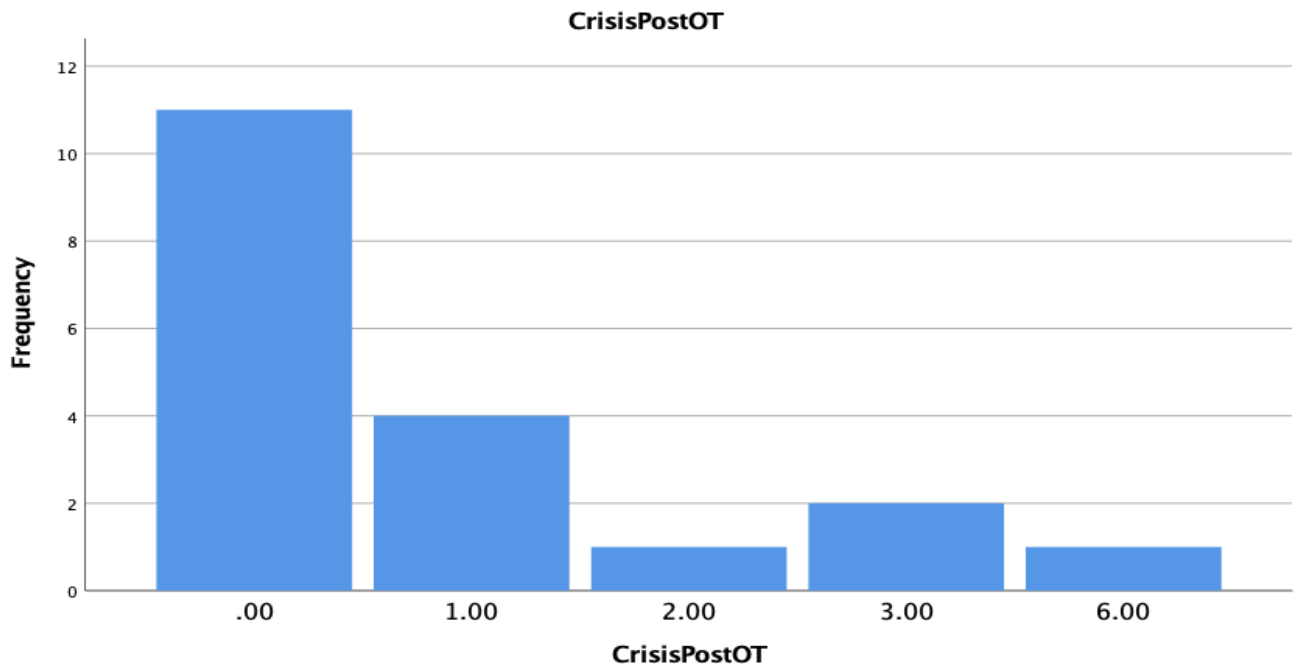
***Crisis Calls and/or Assessments Post OnTrack Enrollment***

<i>N</i>	Valid	19
	Missing	0
<i>Mean</i>		0.9474
<i>Sum</i>		18.00

**Table 2E**

***Crisis Calls and/or Assessment Post OnTrack Enrollment***

	Frequency	Percent	Valid Percent	Cumulative Percent
<i>Valid</i>				
0.00	11	57.9	57.9	57.9
1.00	4	21.1	21.1	78.9
2.00	1	5.3	5.3	84.2
3.00	2	10.5	10.5	94.7
6.00	1	5.3	5.3	100.00
<i>Total</i>	19	100.00	100.00	

**Graph 2c****Variable 3-Suicide Attempts**

Suicide attempts was the next variable collected and analyzed for this particular program evaluation. The total number of suicide attempts amongst all participants prior to being enrolled in OnTrack was 10, which is displayed in Table 3A and Table 3C. Statistics in Table 3C show the mean suicide attempt per patient prior to being enrolled was 0.53. Table 3B displays there have been no reported suicide attempts post enrollment into OnTrack. A Paired Sample t-test demonstrates a significant difference in the number of suicide attempts before and after enrollment into OnTrack  $t(18)=2.137$ ,  $p=0.047$ . The lower confidence interval is 0.01% with the upper confidence interval being 1.04%.

**Table 3A**

***Suicide Attempts Pre-OnTrack Enrollment***

	Frequency	Percent	Valid Percent	Cumulative Percent
<i>Valid</i>				
<i>0.00</i>	14	73.7	73.7	73.7
<i>1.00</i>	2	10.5	10.5	84.2
<i>2.00</i>	2	10.5	10.5	94.7
<i>4.00</i>	1	5.3	5.3	100.0
<i>Total</i>	19	100.0	100.0	

**Table 3B**

***Suicide Attempts Post OnTrack Enrollment***

	Frequency	Percent	Valid Percent	Cumulative Percent
<i>Valid</i>				
<i>0.00</i>	19	100.00	100.0	100.0

**Table 3C**

***Statistics of Suicide Attempts***

		Suicide Attempts Pre-OnTrack Enrollment	Suicide Attempts Post-OnTrack Enrollment
<i>N</i>	Valid	19	19
	Missing	0	0
<i>Mean</i>		0.5263	0.0000
<i>Sum</i>		10.00	0.00

**Variable 4-Inpatient Hospitalization Days**

When analyzing the data for total number of hospital days, OnTrack aims to decrease the number of hospitalization days by 90%. Table 4D shows the total number of inpatient hospital days prior to OnTrack was 186, and this number decreased to 103 inpatient hospital days after patients were enrolled into OnTrack. This is a total decrease of 83 hospital days after admission

to OnTrack, or a 45% decrease. The state of Tennessee has set a benchmark of a 90 % reduction in hospitalization days. Tables 4A and 4D show the mean number of hospital days per client prior to OnTrack was 9.8 and after being enrolled into OnTrack, the mean number of hospital days per client decreased to 5.4. Tables 4A and 4B demonstrate the paired Sample t-test revealed no significant difference regarding number of hospital days before and after OnTrack enrollment  $t(18)=1.77, p=0.092$ . Although total hospitalizations were not a measured outcome variable, Graph 4b displays there was a total decrease from 39 hospitalizations prior to OnTrack down to 18 after being enrolled into OnTrack, which is a 54% decrease in total hospitalizations.

**Table 4A**

**Paired Sample Statistics**

	Mean	N	Std. Deviation	Std. Error Mean
<i>Total Hospital Days Pre-OnTrack Enrollment</i>	9.7895	19	9.87465	2.26540
<i>Total Hospital Days Post-OnTrack Enrollment</i>	5.4211	19	9.96837	2.28690

**4B**

**Paired Sample Test**

**Paired Difference**

	Mean	Std. Deviation	Std. Error	95% Confidence Interval		t	Sig. (2-tailed)
				Lower	Upper		
<i>Hospital Days Pre-OT</i> <i>Hospital Days Post-OT</i>	4.37	10.71	2.46	-0.79	9.53	1.77	0.092

**Table 4C**

**Paired Sample Correlations**

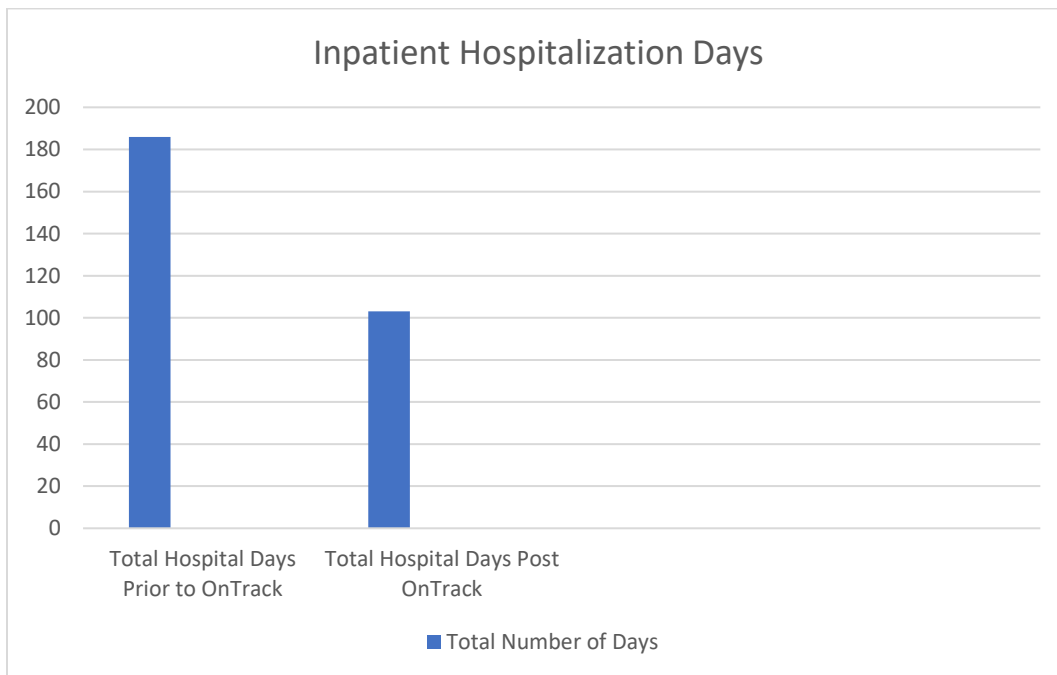
	N	Correlation	Sig.
Hospital Days Pre & Post OnTrack Enrollment	19	0.417	0.076

**Table 4D**

**Statistics of Hospital Days**

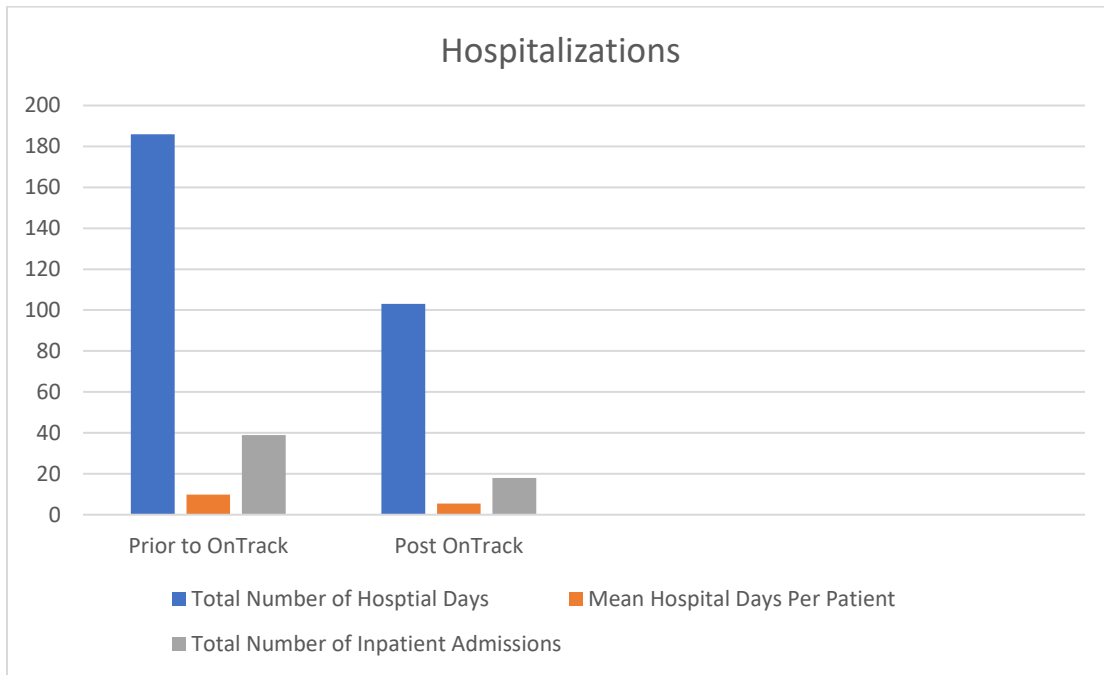
	Hospital Days Pre-OnTrack Enrollment	Hospital Days Post-OnTrack Enrollment
N	19	19
Mean	9.7895	5.4211
Std. Deviation	9.87465	9.96837
Sum	186.00	103.00

**Graph 4a \*not statistically significant**



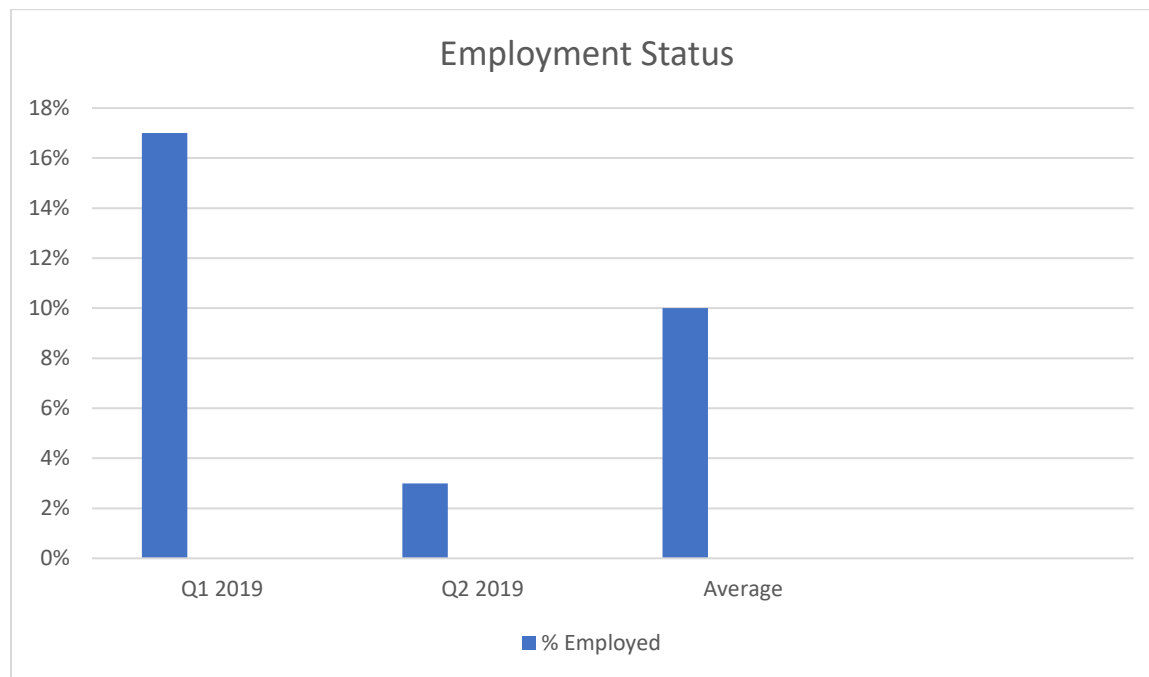


**Graph 4b**



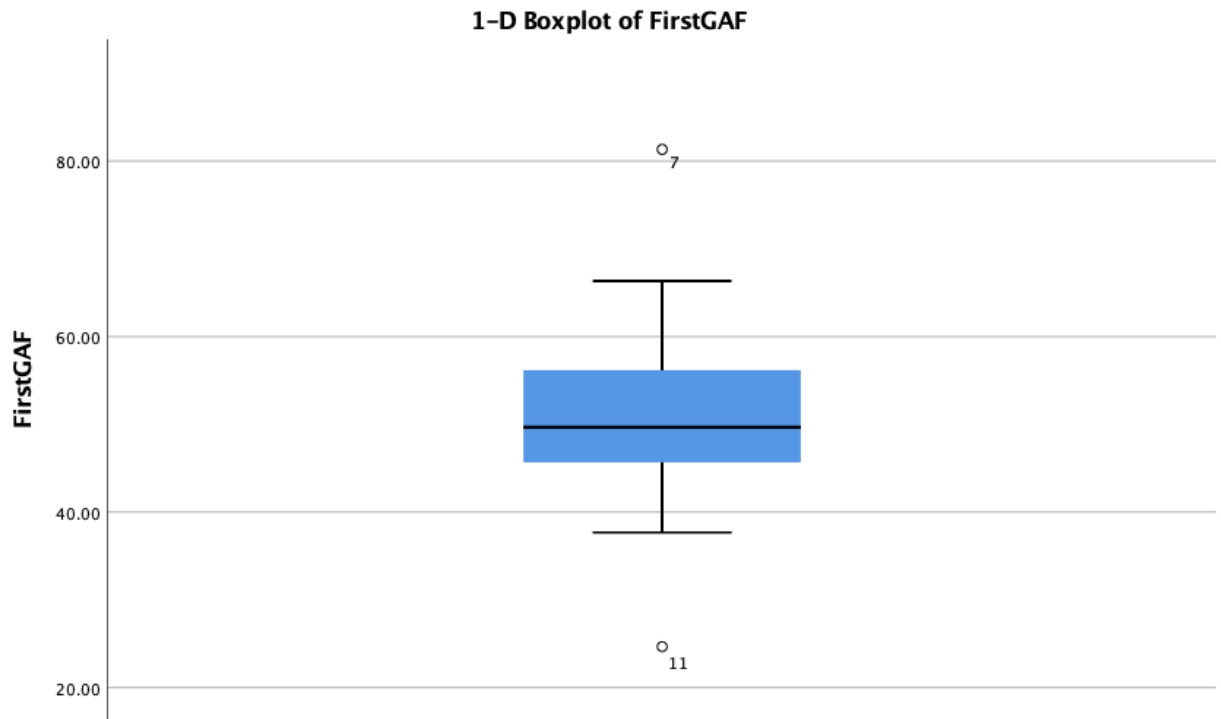
**Variable 5-Employment Status**

When measuring IPS or employment status, the total number of patients enrolled in IPS per month and quarter, were added up and divided by the number of patients who had established and maintained gainful employment. Graph 5a shows the results from the collected data. For the first and second quarters of 2019, there were an average of 11 patients enrolled into the IPS program through OnTrack. For the first quarter, 17%, or 1.9 patients, had maintained gainful employment consecutively for 90 days. For the second quarter, 3%, or 0.3 patients, had maintained gainful employment. Although this is a decrease in employment status, the average for the first two quarters of 2019 was 10% employment.

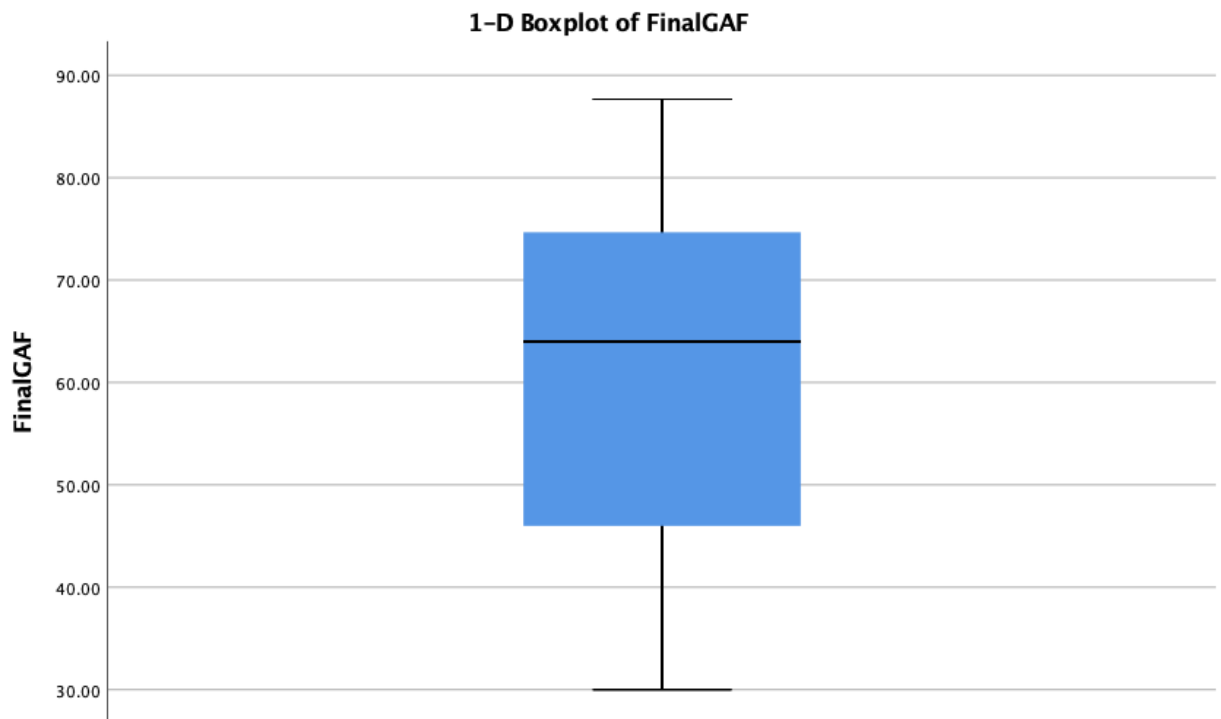
**Graph 5a****Variable 6-MIRECC GAF Score**

Quality of life was the last variable measured using SPSS. The goal of OnTrack is to show improvements in overall quality of life as measured by the MIRECC GAF scale in 60% of the patients enrolled in OnTrack. Analysis of the MIRECC GAF variable revealed that 15 of the 19 patients, or 79%, showed an overall improvement in functioning as measured by MIRECC GAF. Referring to Table 6A, the mean for the first MIRECC GAF score was 51.6, while the mean for the last MIRECC GAF score was 62.2, which is a 17% increase in average MIRECC GAF scores. The means of first and final MIRECC GAF scores are displayed in Graphs 6a and 6b, respectively. In Table 6B, a Paired Sample t test determined there was a statistically significant difference in pre and post MIRECC GAF scores,  $t(17)=2.690$ ,  $p=0.015$ , indicating significance at the .05 level, and is approaching significance.

**Graph 6a**



**Graph 6b**



**Table 6A**

**MIRECC GAF Scores**

	N	Minimum	Maximum	Mean	Std. Deviation
<i>First GAF</i>	19	24.67	81.33	51.5747	12.39271
<i>Final GAF</i>	18	30.00	87.67	62.184	16.96643

**Table 6B**

**Paired Sample Test**

**Paired Differences**

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval		T	Sig. (2-tailed)
				Lower	Upper		
<i>Pair 1</i>							
<i>First GAF- Final GAF</i>	10.50389	16.56465	3.90432	-18.74129	-2.26648	-2.690	0.015

**Discussion**

The purpose of this program evaluation was to measure identified outcome variables to determine if OnTrack, which employs CSC services, are effective at improving patient outcomes. Several benchmarks were identified within the literature, while others were pre-determined by the state of Tennessee. The findings of this program evaluation are consistent with the current literature which suggest that FEP clinics or EPI programs that offer CSC services are an effective intervention for patients who have experienced FEP (Heinssen, Goldstein, & Azrin, 2014). For this program evaluation, patients who were enrolled in OnTrack demonstrated improved outcomes in five of the six identified outcome variables.

For OnTrack to be effective at increasing compliance with medication appointments, patients had to keep an average of 75% of scheduled medication appointments. The average

medication compliance for all patients enrolled in OnTrack during the data collection phase was 75%. A mean of 75% demonstrates OnTrack is successful at increasing and maintaining compliance with keeping scheduled medication appointments. This is significant as this final percentage includes no-show appointments, cancellations, and rescheduled appointments for all of the scheduled medication appointments for patients enrolled into OnTrack. Over 50% of the patients met the benchmark of 75%, while the three patients who had completed the OnTrack program had an average of 83% compliance rate with scheduled appointments. For some patients, they have been enrolled in OnTrack for nearly two years while others have only been enrolled for two months, meaning the compliance rate could be influenced based off the opportunity for the total number of appointments. The results of medication compliance for patients enrolled in OnTrack suggest that CSC services are effective at increasing compliance with medication appointments through providing wrap-around services. Increasing compliance with medication appointments decreases the likelihood of psychotic relapses and involuntary hospitalizations.

Crisis calls were the next variable identified, measured, and analyzed. The length of admission was compared to the same length of time prior to OnTrack enrollment. The total number of crisis calls and/or crisis assessments decreased from 44 to 18, or 59%, after enrollment into OnTrack. The mean crisis call/assessment per patient decreased from 2.3 to 0.95 per patient post enrollment into OnTrack. Of the 19 patients enrolled in OnTrack, 10 had 0-1 crisis call/assessment prior to OnTrack, while the number of patients with 0-1 crisis call/assessment increased to 15 post enrollments into OnTrack. A p value of pre and post data of 0.040 shows a significance at reducing the total number of crisis calls/assessments. A key component of CSC services is being readily available for their patients, and the data presented

demonstrates that OnTrack is effective at decreasing the number of crisis calls/assessment for this vulnerable population. By showing a reduction in crisis calls and/or assessments, OnTrack is also effective at decreasing other hidden healthcare cost that may be involved with the SPMI population such as visits to the emergency department.

Suicide attempts were the third variable tracked for this program evaluation. A t value of 2.137 and p value of 0.47, both show significance at decreasing suicide attempts. OnTrack was successful at meeting this outcome variable as there have been no reported suicide attempts for patients once enrolled. This outcome variable is significant as the SPMI population are at an increased risk of attempting suicide.

The fourth variable, inpatient hospitalization days, decreased from 186 total inpatient hospital days prior to OnTrack down to 103 inpatient hospital days post enrollment. Although this is a 45% decrease in total hospitalization days, the variable did not meet the desired outcome of decreasing total inpatient hospitalization days by 90% which was set by the state of Tennessee. Of note, crisis stabilization unit (CSU) days were included as inpatient days as well. This is important as CSU admissions can be voluntary versus involuntary. The majority of total inpatient hospitalization days were most prominent within the first three months of admission into OnTrack, so this may be an area for future research. Since medication services are not mandatory, more assertive and aggressive engagement is needed earlier in the enrollment period if they are not willing to take psychotropic medications. A p value of 0.092 shows no difference regarding hospital days pre and post enrollment into OnTrack. Lastly, although not an identified outcome variable, the total number of hospitalizations that took place decreased from 39 to 18, or a 54% decrease post enrollment into OnTrack.

IPS was the fifth variable collected and analyzed. OnTrack aims to have 10% of patients enrolled into IPS maintain gainful employment consecutively for 90 days. Of the enrolled patients in OnTrack, only 11 patients were enrolled into IPS as this service is optional. The average of patients enrolled into IPS for the first two quarters of 2019 met the desired outcome of 10%. However, the percentage of enrolled patients into IPS decreased from 17% the first quarter down to 3% for the second quarter. The decrease can be attributed to some patients graduating from the OnTrack program, dropping out of IPS or OnTrack, and less available jobs that are appropriate for this particular population. Research has demonstrated that executive functioning is associated with job complexity, so IPS needs to link patients with competitive employment and identify jobs that offer more accommodations for this population.

The sixth and final variable that was collected and analyzed was quality of life as measured by the MIRECC GAF scale. OnTrack aims to increase MIRECC GAF scores in 60% of the patients enrolled. The outcome was met and OnTrack is successful at increasing overall quality of life as 79% of patients enrolled into OnTrack showed improvement in their scores. Also, the scores collected demonstrate there is an average increase in MIRECC GAF scores of 17% across the patients enrolled into OnTrack. Overall quality of life and functioning is important as unemployment in this population leads to an increase in substance misuse, puts pressure on relationships, and can impact self-esteem (Killackey et al., 2013). One point of interest is that the MIRECC was not able to be measured the entire duration of some of the patient's enrollment period. The master level clinician, or therapist, was not trained and able to score this particular scale until fall of 2018. However, the investigator suspects that the same trend would continue.

Strengths of the project highlight the validity of the data collected for the outcome variables. The patient population of this project is highly specific to individuals who have experienced a FEP and their symptoms have been present for at least one week and for longer than two years. There is specific inclusion and exclusion criteria to be enrolled into OnTrack, so the patient population is specific when measuring outcome variables. Also, there are clear guidelines and criteria for identified outcome variables whether it be within the literature or set by the state's standards. The MIRECC GAF scale is both reliable and valid source. The biggest strength of OnTrack, not necessarily for the project itself, is the flexibility this program and other EPI programs that offer CSC services. Offering such services to a vulnerable population ensures that patient centered care is being provided.

As with all research projects, there are weaknesses and limitations that need to be discussed. To begin, OnTrack is a program still in its infancy as the program just celebrated its two-year anniversary earlier this year in 2019. Where the program is still young, there is still not a great deal of community awareness, so there is a small sample size to gather and analyze data from, but there are also limits on where patients can be recruited from as they must be a resident of Knox Co. Also, OnTrack was not fully staffed until late in the fall of 2018 as this is when the peer-support specialist was hired onto the team. When looking at weaknesses of the project and data collection, not all data was able to be compared equally for pre and post enrollment as some of the data was not present in the chart and was unable to be retrieved. There was also one drop-out from the study. Another weakness with data collection or outcome variables was the MIRECC GAF scores as the master level clinician, or therapist, was not trained to utilize these scales until the fall of 2018. Next, all services that OnTrack has to offer are not mandatory, such as psychotropic medications, which may highlight the instability of this patient population and



possibly even skew some collected data such as crisis calls and inpatient hospitalization days. Severity of illness was not measured using a scale such as the positive and negative syndrome scale when looking at patient outcomes. Lastly, enrolled patients were not compared by what services they were receiving, such as receiving psychotropic medications or which agents they were prescribed, including long-acting injectable antipsychotics.

### **Conclusion**

This program evaluation examines patient outcomes in a real-world setting within a community mental health center. The finding from this program evaluation demonstrate EPI programs such as OnTrack that utilizes CSC services are effective at improving patient outcomes in this complex and vulnerable patient population. Identified patient outcomes from this program evaluation should stimulate mental health organizations to pilot FEP programs that employ CSC services. There is obviously ongoing needed research into the etiology of FEP and schizophrenia, but also the available treatment options to control psychotic symptomatology. Lastly, more research is needed into EPI or FEP programs to identify common strengths and weaknesses in order to continue to improve patient outcomes, specifically inpatient hospitalization days, and provide cost-effective care.

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**Appendix A- Adherence to Scheduled Mediation Appointments**

**Table 1A**

		Descriptive Statistics of Compliance				
<i>Variable</i>	N	Minimum	Maximum	Mean	Std. Deviation	
<i>Compliance</i>	19	50.00	100.00	74.94%	15.78844	

**Table 1B Statistics of Compliance**

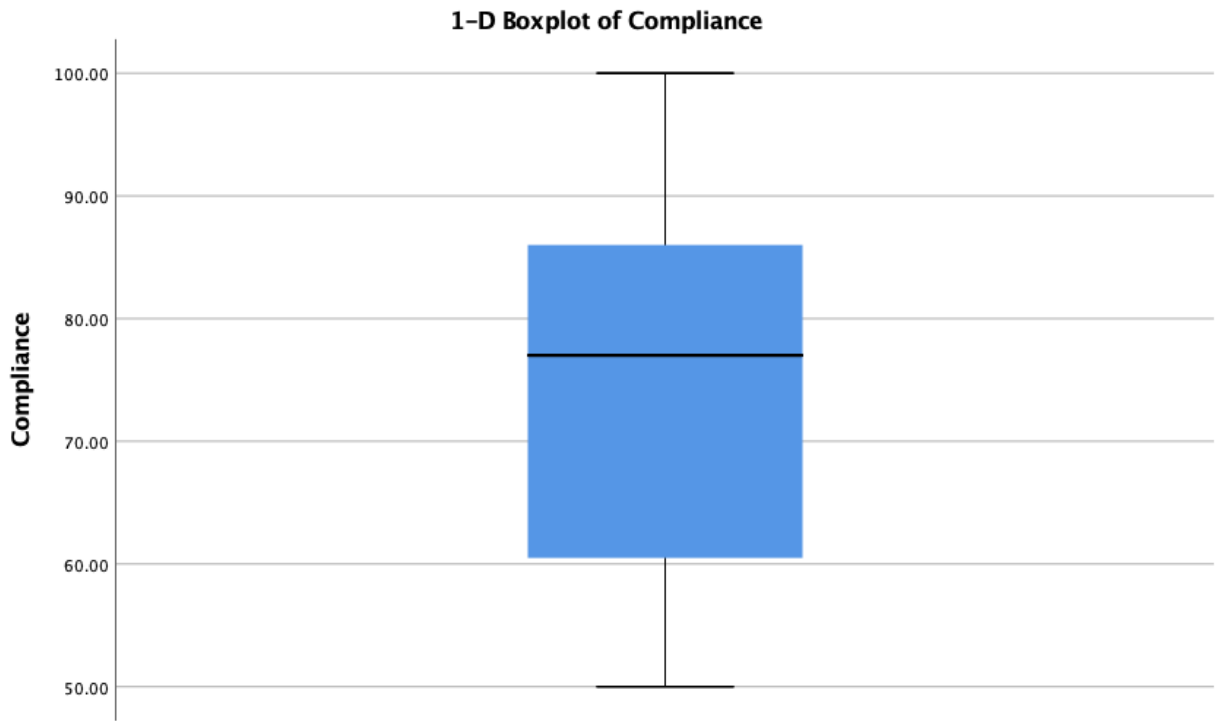
<i>Compliance</i>			
<i>N</i>	Valid	19	
	Missing	0	
<i>Mean</i>			74.9474
<i>Median</i>			77.0000
<i>Mode</i>			80.00

**Table 1C**

**One-Sample Test  
Test Value=0**

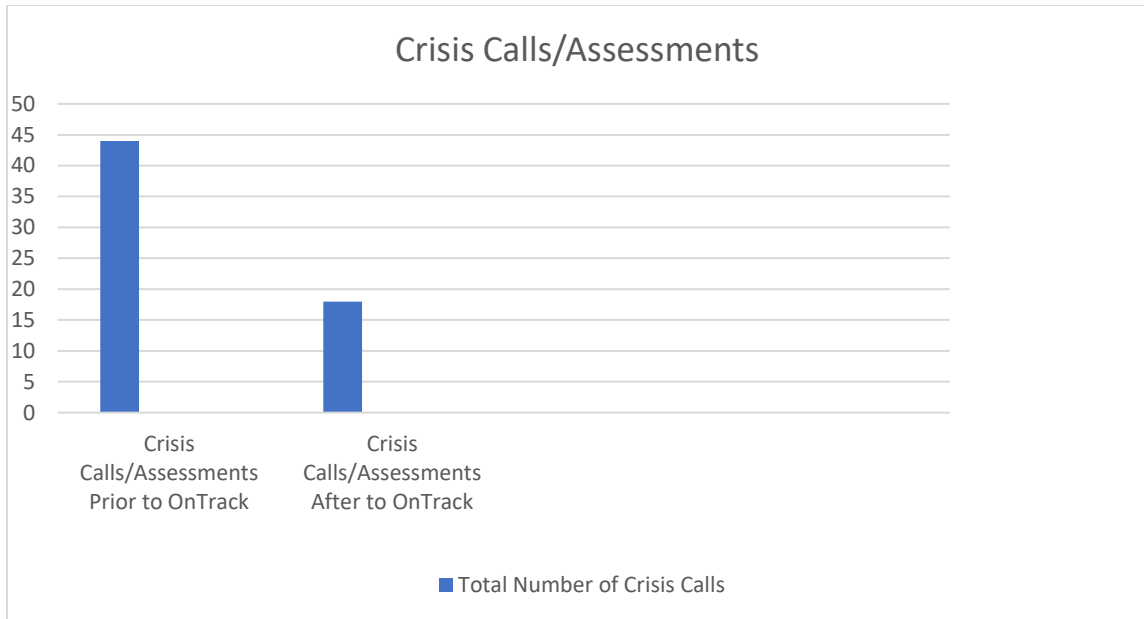
	T	Sig. (2-tailed)	Mean	95% Confidence Interval of the Difference	
				Lower	Upper
<i>Compliance</i>	20.692	0.00	74.94	67.33	82.55

**Graph 1a**



**Appendix B- Crisis Calls and/or Assessments**

**Graph 2a**



**Table 2A**

***Paired Sample Test***

***Paired Differences***

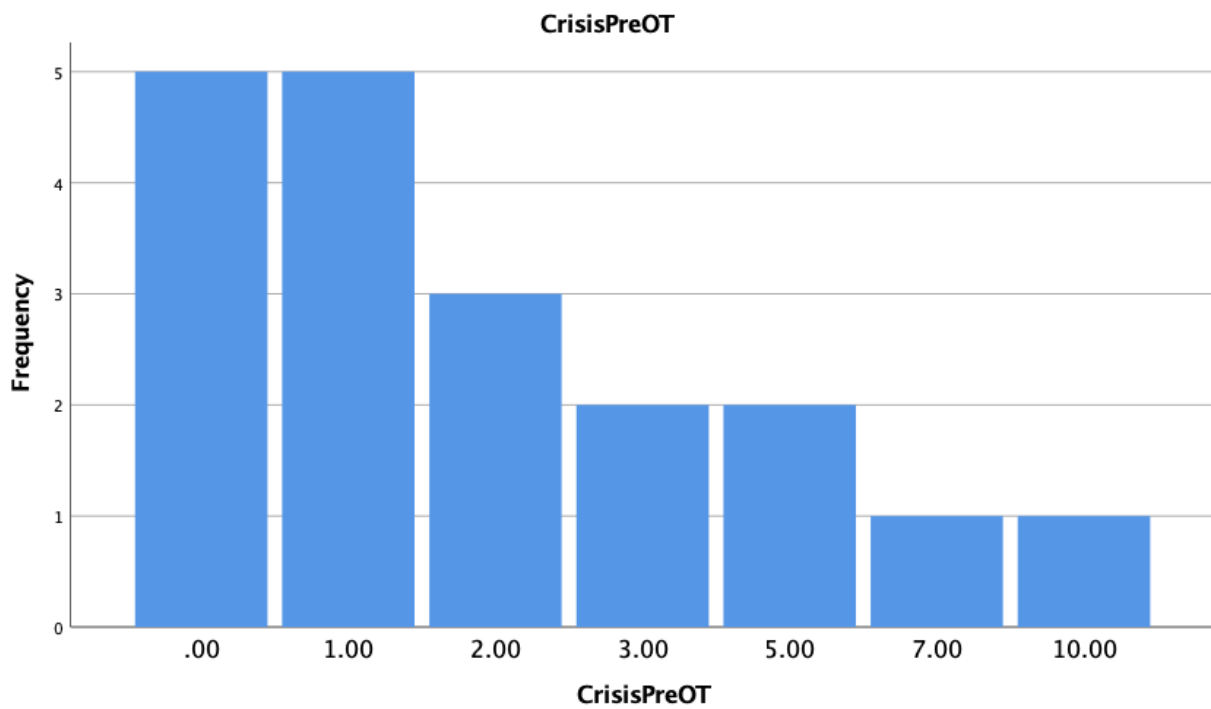
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	Sig. (2-tailed)
				Lower	Upper		
<i>Pair 1 Crisis Pre OnTrack-Crisis Post OnTrack</i>	1.36842	2.69177	0.61753	0.07103	2.66581	2.216	0.040

**Table 2B**

***Crisis Calls and/or Assessments Prior to OnTrack Admission***

<i>N</i>	Valid	19
	Missing	0
<i>Mean</i>		2.3158
<i>Sum</i>		44.00

**Graph2b**





**Table 2C**

***Crisis Calls and/or Assessments Prior to OnTrack Admission***

	Frequency	Percent	Valid Percent	Cumulative Percent
<i>Valid</i>				
.00	5	26.3	26.3	26.3
1.00	5	26.3	26.3	52.6
2.00	3	15.8	15.8	68.4
3.00	2	10.5	15.8	78.9
5.00	2	10.5	10.5	89.5
7.00	1	5.3	5.3	94.7
10.00	1	5.3	5.3	100.00
<i>Total</i>	19	100.00	100.00	

**Table 2D**

***Crisis Calls and/or Assessments Post OnTrack Enrollment***

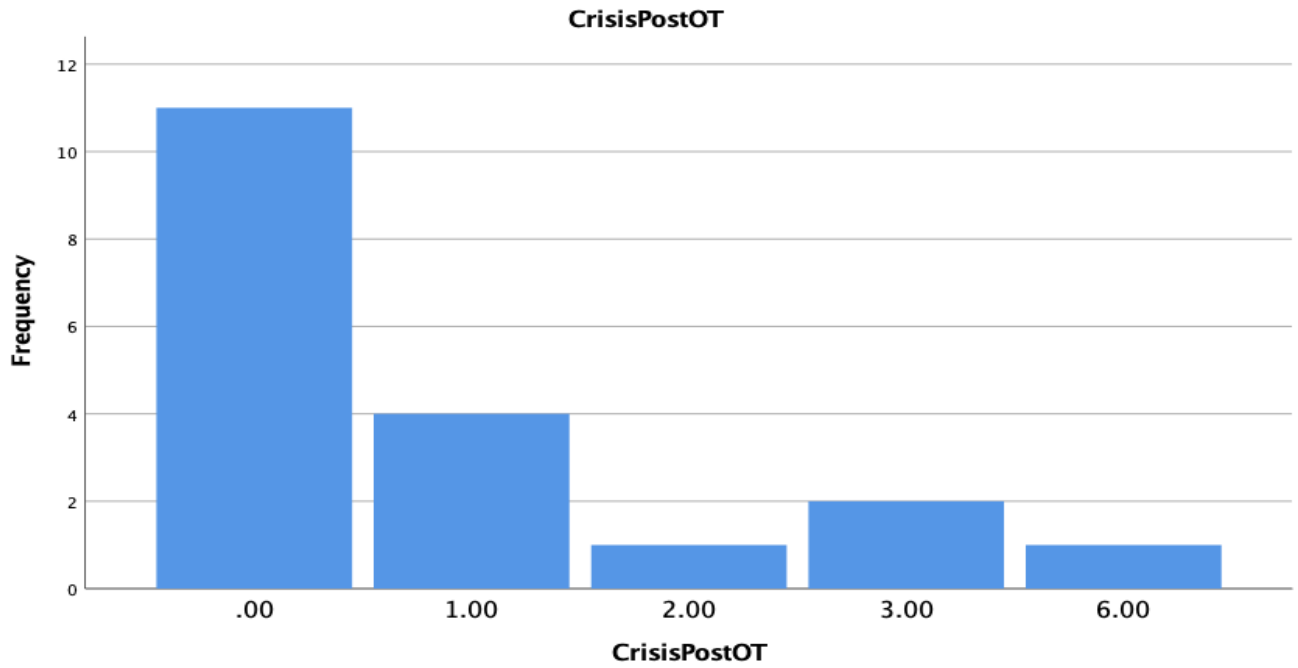
<i>N</i>	Valid	19
	Missing	0
<i>Mean</i>		0.9474
<i>Sum</i>		18.00

**Table 2E**

***Crisis Calls and/or Assessment Post OnTrack Enrollment***

	Frequency	Percent	Valid Percent	Cumulative Percent
<i>Valid</i>				
0.00	11	57.9	57.9	57.9
1.00	4	21.1	21.1	78.9
2.00	1	5.3	5.3	84.2
3.00	2	10.5	10.5	94.7
6.00	1	5.3	5.3	100.00
<i>Total</i>	19	100.00	100.00	

Graph 2c



**Appendix C- Suicide Attempts**

**Table 3A**

***Suicide Attempts Pre-OnTrack Enrollment***

	Frequency	Percent	Valid Percent	Cumulative Percent
<i>Valid</i>				
<i>0.00</i>	14	73.7	73.7	73.7
<i>1.00</i>	2	10.5	10.5	84.2
<i>2.00</i>	2	10.5	10.5	94.7
<i>4.00</i>	1	5.3	5.3	100.0
<i>Total</i>	19	100.0	100.0	

**Table 3B**

***Suicide Attempts Post OnTrack Enrollment***

	Frequency	Percent	Valid Percent	Cumulative Percent
<i>Valid</i>				
<i>0.00</i>	19	100.00	100.0	100.0

**Table 3C**

***Statistics of Suicide Attempts***

		Suicide Attempts Pre-OnTrack Enrollment	Suicide Attempts Post-OnTrack Enrollment
<i>N</i>	Valid	19	19
	Missing	0	0
<i>Mean</i>		0.5263	0.0000
<i>Sum</i>		10.00	0.00

**Appendix D- Inpatient Hospitalization Days**

**Table 4A**

**Paired Sample Statistics**

	Mean	N	Std. Deviation	Std. Error Mean
<i>Total Hospital Days Pre-OnTrack Enrollment</i>	9.7895	19	9.87465	2.26540
<i>Total Hospital Days Post-OnTrack Enrollment</i>	5.4211	19	9.96837	2.28690

**4B**

**Paired Sample Test**

**Paired Difference**

	Mean	Std. Deviation	Std. Error	95% Confidence Interval		t	Sig. (2-tailed)
				Lower	Upper		
<i>Hospital Days Pre-OT</i>	4.37	10.71	2.46	-0.79	9.53	1.77	0.092
<i>Hospital Days Post-OT</i>							

**Table 4C**

**Paired Sample Correlations**

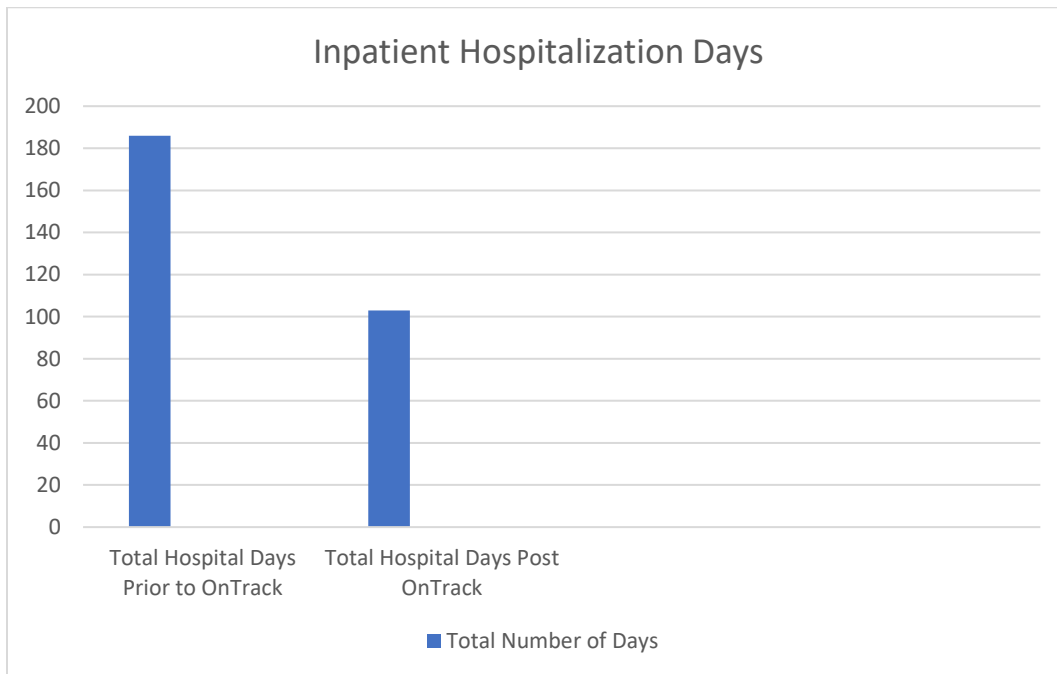
	N	Correlation	Sig.
<i>Hospital Days Pre &amp; Post OnTrack Enrollment</i>	19	0.417	0.076

**Table 4D**

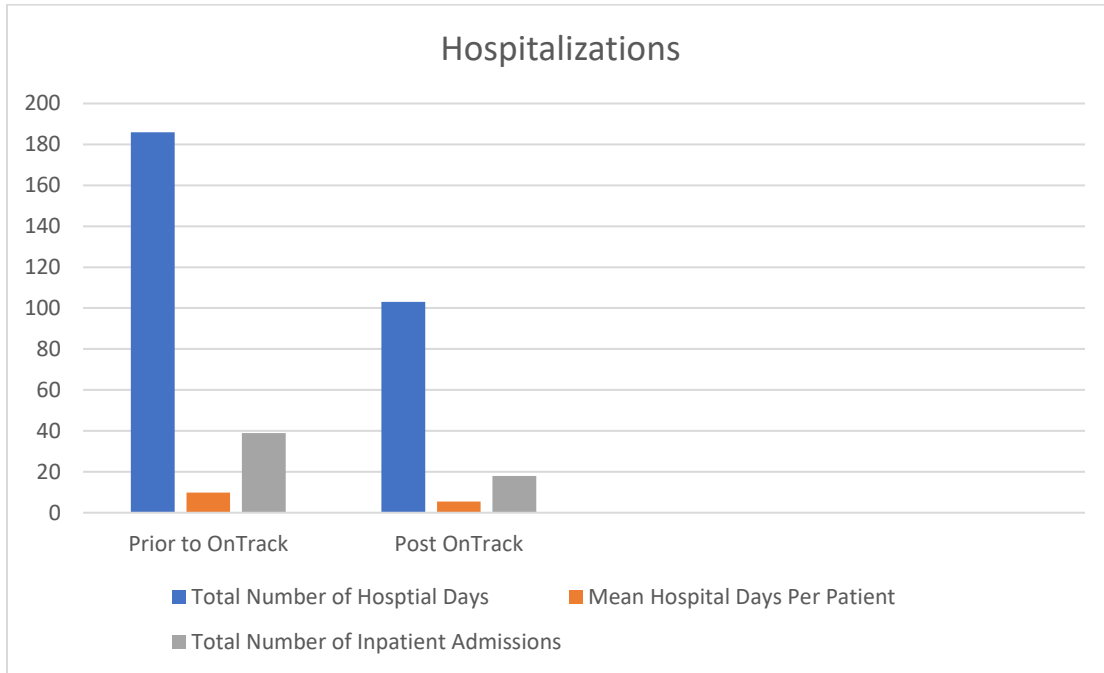
**Statistics of Hospital Days**

	Hospital Days Pre-OnTrack Enrollment	Hospital Days Post-OnTrack Enrollment
<i>N</i>	19	19
<i>Mean</i>	9.7895	5.4211
<i>Std. Deviation</i>	9.87465	9.96837
<i>Sum</i>	186.00	103.00

**Graph 4a \*not statistically significant**

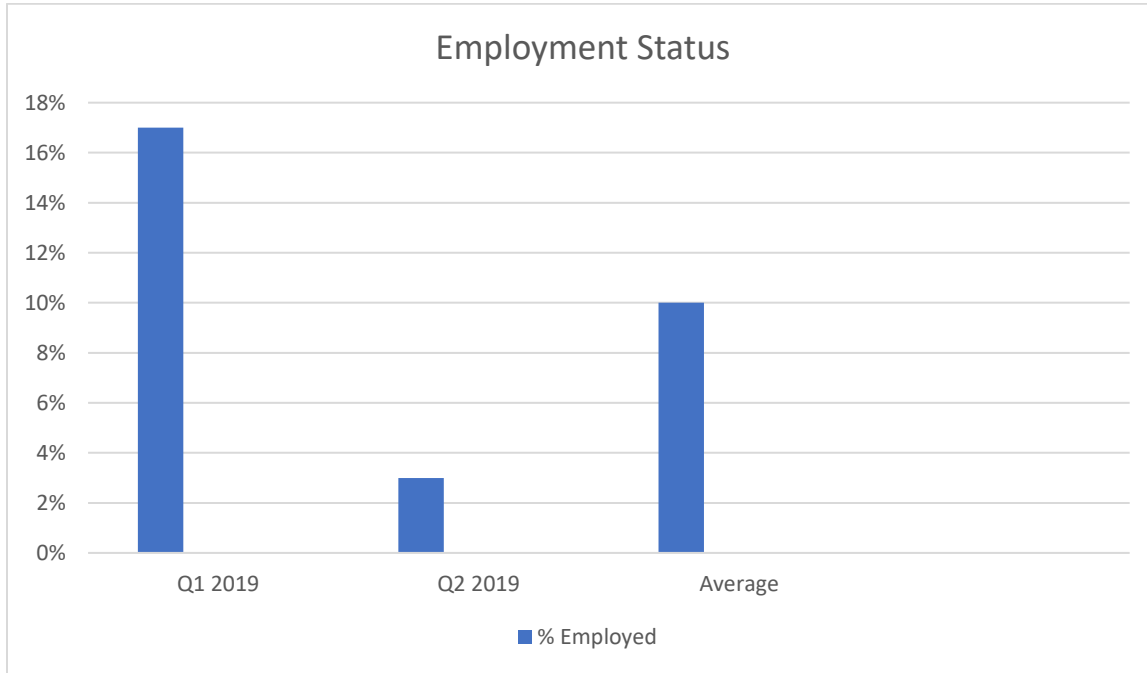


**Graph 4b**



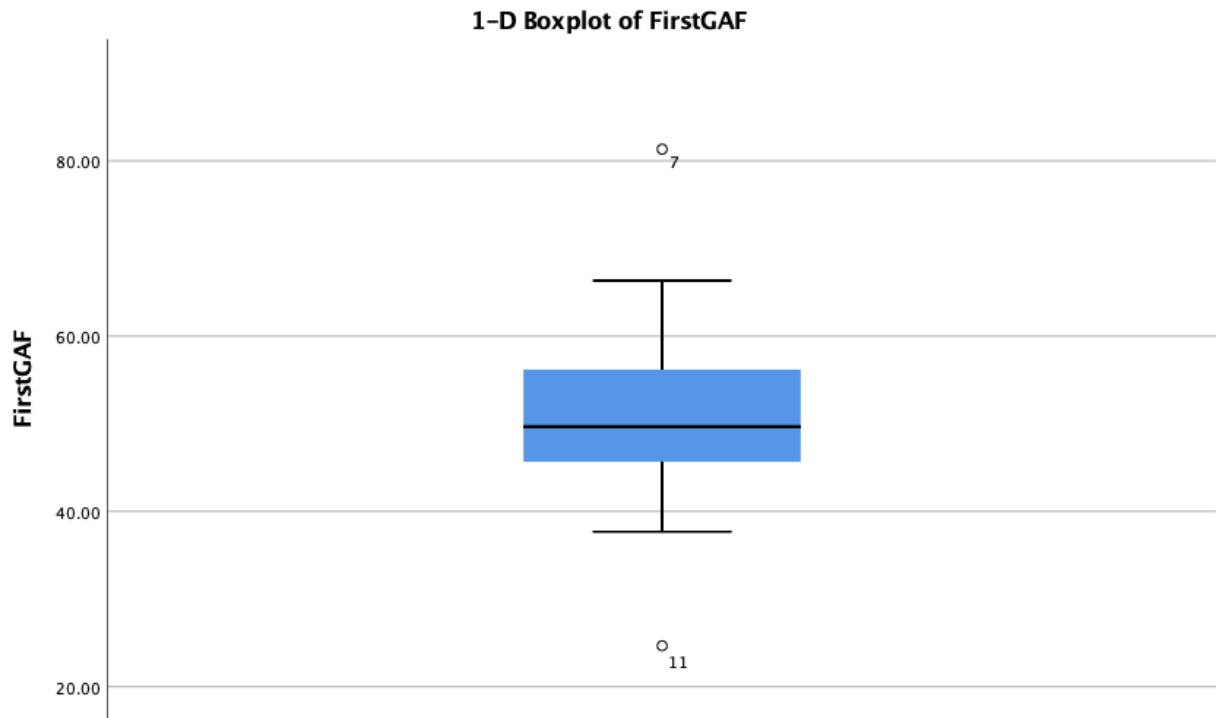
### Appendix E-Employment Status

**Graph 5a**



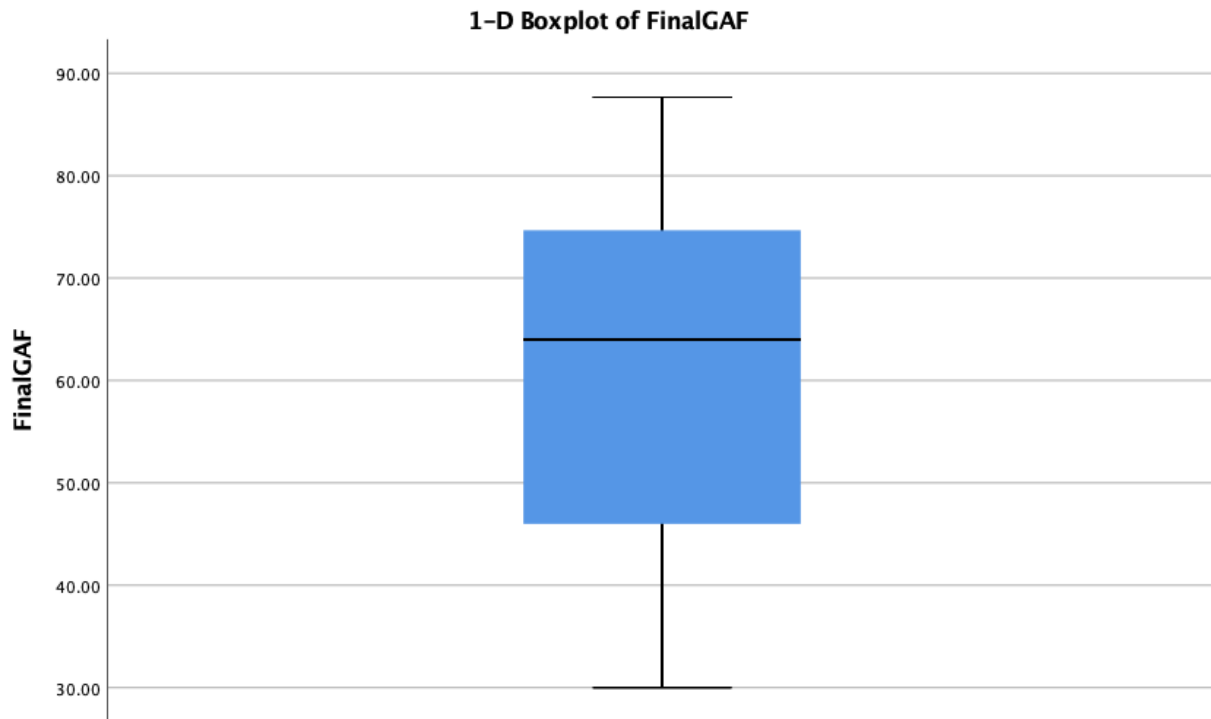
### Appendix F- MIRECC GAF Score

Graph 6a





**Graph 6b**



**Table 6A**

**MIRECC GAF Scores**

	N	Minimum	Maximum	Mean	Std. Deviation
<i>First GAF</i>	19	24.67	81.33	51.5747	12.39271
<i>Final GAF</i>	18	30.00	87.67	62.184	16.96643

**Table 6B**

**Paired Sample Test**

**Paired Differences**

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval		T	Sig. (2-tailed)
				Lower	Upper		
<i>Pair 1</i>							
<i>First GAF- Final GAF</i>	10.50389	16.56465	3.90432	-18.74129	-2.26648	-2.690	0.015