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Identifying the Effects of the COVID-19 Pandemic on Individuals with Dual Diagnoses (Mental Health and Substance Use) at CenterPointe Residential Treatment Center

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FINAL DNP PROPOSAL

IDENTIFYING THE EFFECTS OF THE COVID-19 PANDEMIC ON INDIVIDUALS WITH DUAL DIAGNOSES (MENTAL HEALTH AND SUBSTANCE USE) AT CENTERPOINTE RESIDENTIAL TREATMENT CENTER

By

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Abstract

Background: Social distancing measures associated with the COVID-19 pandemic began on March 28th, 2020 in the United States. With these implemented measures, the mental health of the population was worsening due to isolation, closures, and fear. Rates of anxiety, depression, and co-occurring substance abuse increased as well. CenterPointe is a behavioral health organization that has a residential treatment facility in Omaha, Nebraska for patients with mental health and substance use disorder dual diagnoses. They utilize the DLA-20 tool with their patients at intake, every 90 days, and at discharge. The DLA-20 is a standardized tool that assesses an individual's functioning in daily life.

Objectives: The purpose of this study was to identify the effect of COVID on daily functioning by analyzing the DLA-20 scores, identify treatment completion and goals met, determine prominent demographic data, and to analyze changes in mental health or substance use disorder diagnoses.

Method: This was a retrospective cohort study analyzing a deidentified data set with two groups. The groups were pre-COVID (March 29th, 2018- March 29th, 2020) and post-COVID (March 30th, 2020-March 23th, 2022) and consisted of individuals in CenterPointe's residential treatment program.

Results: Individuals admitted during COVID had higher DLA scores on admission than individuals admitted pre-COVID. Fewer individuals had completed treatment as well as met their goals with COVID compared to pre-COVID. The results also revealed a decrease in the homeless population and an increase in unemployed individuals post-COVID. Nicotine use decreased by 5% and cocaine use increased by 4% post-COVID.

Conclusions: The DLA-20 results revealed that people in the post-COVID category entered the treatment program with a higher DLA score indicating a higher level of functioning than individuals admitted during the height of the pandemic. This indicates that the COVID-19 pandemic may not have caused an increase in symptoms and impairment of functioning among the individuals being treated at CenterPointe's residential treatment center as originally assumed. The study also highlighted the usefulness of the DLA-20 tool to assess functioning in individuals with a mental health and substance use disorder diagnosis amidst the COVID-19 pandemic.

Introduction

On March 11th, 2020, COVID-19 was declared a pandemic by the World Health Organization. In the two weeks that followed, President Trump declared COVID-19 a national emergency, Centers for Medicaid and Medicare Services (CMS) temporarily expanded the use of telehealth, travel bans were implemented, and states began to temporarily shut down schools, restaurants, and businesses. By March 28th, 2020, the White House extended social distancing measures through the end of April 2020. States continued lockdown measures to prevent the spread of COVID-19 (Centers for Disease Control, 2022). At this time, the pandemic and the necessary safety precautions implemented directly affected the majority of people not only in the United States but around the world. As the death toll continued to rise, society's mental health and wellness declined. Social isolation, job loss, and school closures were a few of the many secondary effects of the virus (CDC, 2022). Since the start of COVID-19, there has been an increase in studies examining the psychological impact social isolation and shutdown has had on individuals. According to the U.S. Census Bureau, rates of anxiety and depression were "three times higher" during the pandemic than in 2019 (Twenge & Joiner, 2020). These numbers were taken from across the U.S. population in people that may have had no mental health concerns prior to the pandemic. It is essential to consider whether the pandemic caused a worsening of symptoms and impairment of functioning among already vulnerable people with a previous mental health or substance use disorder diagnosis.

According to the Substance Abuse and Mental Health Services Administration (SAMHSA, 2022), individuals with mental health disorders are also more likely to experience substance use disorders than those not affected by a mental health disorder. Co-occurring mental health and substance use disorders are also known as a dual diagnosis. In 2019, the National

Survey on Drug Use and Health found that 24.5% of adults 18 years or older (or 61.2 million people) had either a mental health or substance use disorder. 3.8% (or 9.5 million people) had both a mental illness and substance use disorder, up from 3.5% (or 8.1 million) in 2015 (SAMHSA, 2020). The increase in 1.4 million people with co-occurring mental health and substance use disorders from 2015 to 2019 shows the significant need for dual diagnosis treatment.

The first step in treating this population is being able to accurately identify these co-occurring disorders. After identification, agencies must implement proper evidence-based treatment plans. CenterPointe is an organization that serves individuals in Nebraska with their primary clinic in Lincoln. However, this study focused specifically on CenterPointe's residential treatment program in Omaha.

Current assessment and treatment strategies are often diagnosis specific and can lead to ineffective treatment for individuals with dual diagnoses. At CenterPointe, each person is assessed using the Daily Living Activities-20 (DLA-20) on admission, discharge, and every 90 days during treatment. The DLA-20 is a standardized tool administered by a clinician to determine an individual's level of functioning over the past 30 days. It involves asking the person a series of questions categorized under 20 different areas of daily living. These domains include health practices, housing stability/maintenance, communication, safety, managing time, managing money, nutrition, problem-solving, family relationships, alcohol/drug use, leisure, community resources, social network, sexuality, productivity, coping skills, behavior norms, personal hygiene, grooming, and dress. The scores range from 1 to 7, 1 being "extremely severe functional impairment, needs pervasive supports" and 7 being "WNL-Strength optimal

independence with no support." **Appendix A** provides an overview of the DLA-20 assessment with the scoring. Each score and associated DLA domain are further discussed in **Appendix B.**

Problem Statement

The topic of mental health has become less stigmatized in recent years leading to better access to services. However, there are still challenges to treating both mental health and substance use conditions. The social distancing measures associated with the pandemic caused a disruption in access to mental health treatment. Socioeconomic factors play a major role in the prognosis of mental health. Access to shelter, food, water, income, etc., can greatly affect how likely and able a person is to receive treatment. Other factors may include a poor support system and reduced access to mental health treatment. These barriers can affect an individual's ability to seek help, adhere to a wellness plan, and succeed after treatment. Most articles have previously examined the rising rates of mental health diagnoses, but not how they affect the individual and their daily functioning. Symptoms can be difficult to quantify, especially when self-reported, as they are subjective to each person and vary depending on their perceived and actual level of severity. For many with mental health or substance use disorders, improving the quality of life is an important goal. One way to monitor quality of life is by measuring an individual's level of day-to-day functioning. Level of daily functioning can be measured multiple ways, but one of the most common is through a daily living activities assessment such as the DLA-20. This includes the ability to manage money, personal hygiene, personal relationships, living situation, and others. These assessments help to rate the severity of an individual's mental health. Each assessment can show an improvement or decline in the level of functioning over time. Functioning was especially important to assess during COVID, as daily living had changed for the majority of people. One could predict that if an individual was more acutely ill, they would

have more difficulty with daily tasks and therefore would score lower on the DLA-20, indicating a higher need for intervention. Conversely, a more stable individual who could care for themselves with greater ease would have a higher score, indicating less support is needed. A literature search identified no articles detailing how individuals with co-occurring disorders faired during the pandemic. This highlights the need for further analysis of how COVID affected those with a dual diagnosis.

Purpose Statement

The purpose of this study was to identify the specific effects COVID had on individuals in CenterPointe's short-term residential program in Omaha by comparing DLA-20 scores prior to COVID and after the start of COVID. March 30th, 2020 is the date CenterPointe's services switched to social distancing protocols including implementing telehealth, masking, testing, and pausing of certain services.

Specific Aims

- To identify the effect of the COVID pandemic on the daily functioning of individuals with a dual mental health and substance use disorder diagnosis in CenterPointe's residential program using DLA-20 scores.
- To identify treatment completion rates and the rate at which goals were met pre-COVID compared to post-COVID.
- To identify any shift in the demographics of individuals who utilized CenterPointe's residential services pre-COVID compared to post-COVID.
- To identify any increase or decrease in individual mental health or substance use disorder diagnoses pre-COVID compared to post-COVID.

Clinical Question

Clinical question #1: For individuals utilizing CenterPointe's short-term residential program in Omaha, was there a difference in admission and discharge DLA scores from the two years prior to the start of the pandemic (March 29th, 2018 - March 29th, 2020) compared to the two years after the start of the pandemic (March 30th, 2020 – March 30th, 2022) indicating the

pandemic may have had a significant effect on daily functioning. Clinical question #2: How many individuals completed treatment and met their goals pre-COVID compared to post-COVID. Clinical questions #3 and 4: Was there a difference in demographics of the individuals utilizing CenterPointe's residential services, as well as an increase or decrease in certain mental health and substance use disorder diagnoses during these two time periods.

Review of the Literature

While the topic of COVID became more heavily researched in the immediate years following the start of the COVID-19 pandemic, there remains very limited research on its effect on mental health using the DLA-20 or a similar assessment tool able to identify functional impairment related to the pandemic. There were seven relevant articles at the end of the search. Kelly et al. (2022) assessed COVID's effect on opioid use disorders within individuals in a supportive housing program. The DLA-20 was not utilized in this study however, they did conduct interviews to show the impact of COVID on the social determinants of the participants. The results showed an increase in drug use in the population of people who use drugs, as well as increased feelings of sadness, boredom, irritability, anxiety, and loneliness (Kelly et al., 2021). Lugo-Marin et al. (2021), analyzed adults with autism spectrum disorder (ASD) and the psychological impact of COVID. This study found a decrease in "psychopathological problems" associated with social isolation. Nutrition and stress levels were reportedly improved (Lugo-Marin et al., 2021). These findings were relevant to the project. While the traits associated with ASD may have improved, it is important to note that adults with ASD are not the primary population examined in this project.

Another substance-related study completed by Abarna et al. (2021) sought to examine the impact of COVID and the functional ability to complete daily activities in relation to cannabis

use. This study utilized the COVID-19 Functional Impairment tool. The results identified that people who used cannabis had a greater risk of functional impairment related to COVID as well as increased difficulty with “emotional regulation and COVID-related distress” (Abarna et al., 2021). A study conducted by Gonzáz-Sanguino, et al. (2020) was one of the first to examine the psychological impact of COVID-19 specifically in the Spanish population during the initial alarm state. This study focused on the potential for mental health diagnoses such as the increased diagnoses of depression, anxiety, and post-traumatic stress disorder (PTSD). Gonzáz-Sanguino, et al. also found that females were more likely to develop symptoms of anxiety and PTSD. Kurose et al. (2022) also found that female patients were more affected by the pandemic than male patients. This study yielded an increased risk of worsening symptoms in those with preexisting mood disorders. On the opposite end of the spectrum, those with schizophrenia were less likely to show any exacerbation of symptoms with the pandemic. Another study that focused on PTSD symptoms was conducted by Yuan et al. (2021). They specifically examined rates of post-traumatic stress symptoms (PTSS) among COVID survivors. Compared to the healthy population, COVID survivors in Chongquing, China were more likely to have PTSS at a prevalence of 18.66% (Yuan et al., 2021). However, this rate was lower than both Italy (28%) and Shenzen, China (31%). Lastly, Chou et al. (2022) assessed substance use, mental health, daily living, and family functioning among both pregnant and postpartum women in a residential facility during COVID. This study yielded positive outcomes for all the participants in the areas of substance use and daily functioning before and after the pandemic onset. The literature search shows the need for more research in this area. While mental health diagnoses are a correlating factor indicating some level of functional impairment, the diagnosis itself does not indicate the

type nor severity of impairment. This study sought to investigate and identify specific information regarding impairment in functioning related to the onset of COVID.

Conceptual/Theoretical Framework

The Systems Model nursing theory provided the theoretical framework for this study. In this systems model, Neuman proposed that there are three environments that affect a person: internal, external, and created. The created environment of an individual supersedes the internal and external environment. This environment is unconsciously developed to maintain basic functioning of that individual, including stability and coping mechanisms (McDowell et al., 2023). Humans have an inherent drive to protect themselves. When the pandemic began, most individuals were forced to change their lives whether that be working from home, loss of work, or social isolation from others. This change in environment leads to the unconscious development of new coping mechanisms and protective strategies to maintain some sort of normal internal systems functioning. Some of these strategies and mechanisms are healthy and some unhealthy, but all are unconsciously made to protect the individual's sense of safety and control.

The Systems Model theory strongly relates to the residential program at CenterPointe. They have an environment that assists in alleviating the need for heightened protective factors, thus allowing a therapeutic environment to focus on mental health and substance use disorder treatment. As mentioned before, individuals with mental health and substance use disorders were already at increased risk for impaired functioning prior to the pandemic. According to the System Model theory, we would expect that rates of substance use and mental health disorders would rise from the stress the pandemic caused due to the unconscious shift of the created environment to maintain stability. A hypothesis would be that DLA-20 scores on admission

would have decreased due to unhealthy coping mechanisms and social isolation indicating a worsening level of daily functioning. Ideally, levels of functioning at discharge, evidenced by higher DLA scores upon discharge from residential treatment, will have improved.

Methodology

Study Design

This study is a retrospective cohort study. An Institutional Review Board (IRB) Analyst in the Office of Regulatory Affairs from the University of Nebraska Medical Center (UNMC) determined the study to be exempt from submission to the IRB due to the data being deidentified by the organization (CenterPointe). UNMC determined the study not to be human subject research requiring IRB approval.

Subjects

Inclusion criteria were adults ages 19-65, who were enrolled in CenterPointe's Omaha short term residential program from March 29th, 2018, through March 30th, 2022 (N=1514). Individuals admitted after March 29th, 2018 and discharged before March 29th, 2020 are known as the "pre-COVID" group (N=739). Individuals admitted after March, 30th, 2020 and discharged before March 30th, 2022 are known as the "post-COVID" group (N=775). Exclusion criteria included telehealth patients and patients with a singular mental health or substance use disorder diagnosis. Individuals that fell under both groups, such as those who were admitted prior to March 30th, 2020 and discharged after March 30th, 2020, were also excluded.

Setting

CenterPointe is an organization that serves people in Lincoln and Omaha, Nebraska. Their focus is on mental health and substance use disorders, but they recently added a primary care component in hopes of providing comprehensive care to their patients. They have more than

35 programs that include treatment, rehabilitation, housing, crisis response, veteran services, and others. They also offer outpatient services, residential treatment, short-term treatment, assertive community treatment, and intensive outpatient services for people with both mental health and substance use disorders. They offer services for co-occurring disorders (mental health and substance use) for adults 19 and over. This program includes individual, group, and family counseling; psychiatric care; nursing care; recreational therapy; nutritional services; mental health, substance use, wellness, and life skills education; and care management. The typical length of stay is between 28-45 days, but the length of service is individualized therefore individuals can stay shorter or longer if needed.

Tools & Measures

The DLA-20 is a simple and easily utilized tool that assists behavioral healthcare providers in assessing the daily functioning ability of the individual. The scoring of the DLA-20 helps guide the provider in developing a plan for the individual's highest needs and most critical services. A study published in 2001 determined the scale had appropriate and adequate internal consistency and interrater reliability. The tool was evaluated at two community health agencies and supported its validity and sensitivity to change (Scott & Presmanes, 2001). Cronbach's alpha shows internal consistency with a coefficient alpha = .97 and has interrater reliability with an intraclass correlation coefficient = .83. Its practicality was found to be easy to learn, use, and cost effective (Scott & Presmanes, 2001). CenterPointe has used the DLA-20 since 2014 and has since established proper staff training regarding the use of the DLA-20. The exposing factor includes the overall effects the pandemic had upon society including the closure of numerous daily functions such as school, work, businesses, and most of Centerpointe's in-person operations. CenterPointe shifted the majority of outpatient services to telehealth on March 30th,

2022. Its residential program remained intact and open with social distancing precautions in place.

Data Collection

The data was collected by CenterPointe's behavioral health providers on admission to the residential treatment facility in Omaha. The data were then compiled by the quality improvement director from the secure electronic health record (EHR). CenterPointe utilized a business intelligence tool which combined the data into one report. The report was then exported to Excel where patient identifiers were removed. Each individual's data were randomly assigned a number from 1 to 2679 further de-identifying the data. The Excel sheet was then sent to the authors and the data were stored in a secure SharePoint cloud account that only the authors had access to at the University of Nebraska Medical Center. From there, the authors analyzed the data alongside a statistician using SPSS. The following categories were recoded within the data set to allow for statistical analysis: current living arrangement, employment status, discharge type, clinical outcome, substance 1, substance 2, substance 3, sexual orientation, ethnicity, and marital status. Substance 1 refers to the substance the individual reported using most often followed by substances 2 and 3, being the second and third most reportedly used.

Timeline

The project began in Spring of 2022 with initial development in collaboration with CenterPointe. After developing initial aims for the study, CenterPointe shared relevant de-identified patient data in Fall of 2022 via Excel sheet. In January 2023, the data was dissected alongside the statistician using SPSS with the specific aims in mind. The results were sent to CenterPointe in April of 2023.

Analysis

The analysis was derived from the specific aims listed earlier. The analysis took place using SPSS with the help of a statistician. The primary analysis compares the pre-pandemic DLA-20 scores to the post-pandemic DLA-20 scores to determine if there were any significant changes to daily functioning of individuals with a dual diagnosis who were receiving treatment in CenterPointe's residential program. Overall average admission and discharge DLA-20 scores were compared along with all twenty DLA-20 domains utilizing an independent *t*-test. The difference DLA scores were also compared and account for the difference between the admission and discharge scores.

Next, chi-square analysis was used in the comparison of individual demographics pre-COVID and post-COVID as well as identifying treatment completion and goals met. Specific demographics of interest to CenterPointe were identified and compared including sex, race, sexual orientation, current living arrangement, and employment status. Lastly, changes in prevalence of any specific mental health or substance use disorder diagnoses pre-COVID and post-COVID were identified. Chi-square analyses were also utilized in the comparison of all mental health and substance use disorder diagnosis listed in the data provided. The mental health diagnoses include Schizophrenia related diagnoses, Bipolar Disorder, Major Depression (single), Major Depression (recurrent), Antisocial Personality Disorder, Borderline Personality Disorder, Anxiety Disorder, Post-Traumatic Stress Disorder (PTSD), and MH Disorder (other mental health diagnoses not categorized). The substance use disorder diagnoses include Nicotine, Cocaine, Cannabis, Opioids, Alcohol, Amphetamines, and SA Disorder (other substance use disorder diagnoses not categorized).

Results

Sample Characteristics

The individuals in the pre-COVID group had a mean age of 40.6 years with a standard deviation (SD) of 11.4 years. This group consisted of more males (64%) than females (36%). There was a majority of White (79%) and Non-Hispanic (94%) individuals. The individuals in the post-COVID group had a mean age of 37.9 years with an SD of 11.5 years. This group also consisted of more males (66%) than females (34%). Similar to the pre-COVID group, there was a majority population of White (78%) and Non-Hispanic (90%) individuals.

***Aim 1*: To identify the effect of COVID on daily functioning of individuals with a dual mental health and substance use disorder diagnosis in CenterPointe's residential program using DLA-20 scores.**

There was a significant difference in the Admission Average DLA score pre-COVID compared to post-COVID, $p = .03$, see Table 1. However, there was not a significant difference in Discharge Average DLA score pre-COVID compared to post-COVID, $p = .92$. There was also no significant difference with the Difference Average DLA score pre-COVID compared to post-COVID, $p = .09$; see Table 1. Of the domains associated with the Admission DLA scores, health practices, housing stability/maintenance, safety, managing time, managing money, nutrition, family relationships, leisure, community resources, personal hygiene, and grooming were significantly different. Of the domains associated with Discharge DLA scores, family relationships, social network, behavior norms, personal hygiene, and grooming were significantly different, see Table 4 in Appendix C.

Table 1. Difference in DLA Scores

		N	Mean	SD	*t*	df	*p*-value
Admission average DLA score	pre-COVID	739	3.25	0.64	-2.22	1512	.03
	post-COVID	775	3.33	0.69			
Discharge average DLA score	pre-COVID	739	4.03	0.98	-0.11	1496.57	.92
	post-COVID	775	4.03	0.93			
Difference average DLA score	pre-COVID	739	0.77	0.86	1.71	1458.75	.09
	post-COVID	775	0.70	0.75			

Note. Standard Deviation (SD)

***Aim 2*: To identify treatment completion and if goals were met pre-COVID compared to post-COVID.**

64% of individuals in the pre-COVID group completed the treatment program in totality compared to 57% of individuals in the post-COVID group, $\chi^2(2)=8.58$, $p = .01$. Of those who completed the treatment program, 61% attained all goals met pre-COVID compared to 57% meeting goals post-COVID, $\chi^2(3)=24.72$, $p <.001$.

***Aim 3*: To identify any shift in the demographic of individuals utilizing CenterPointe's residential services pre- compared to post-COVID.**

There was a significant difference in individuals' living arrangements, see Table 2. Those living in private settings without support went from 35% pre-COVID to 48% post-COVID, $p = <.001$. Additionally, the percentage of homeless individuals went from 16% pre-COVID to 13% post-COVID. Employment rate of the population went from 9% pre-COVID to 8% post-COVID, $p = .003$, and the percentage of the population disabled went from 19% pre-COVID to 12% post-COVID. There was consistently a larger category of heterosexual individuals compared to non-heterosexuals, however, that did change from 93% pre-COVID to 89% post-COVID, $p = .02$. The results from ethnicity displayed a larger non-Hispanic population going from 94% pre-COVID to 90% post COVID, $p = .004$. Most individuals were recorded as single, and this

changed post-COVID from 67% to 75%, p = .01. Majority of individuals were white (79%) compared to non-white (21%) and there were also more males (64%) than females (36%), however these were not statistically different.

Table 2. Demographics

		Pre-COVID (n)	Post-COVID (n)	
Living arrangement	Private w/o support	244 (35%)	371 (48%)	$\chi^2(4) = 27.23$, p= <.001
	Private w/ support	118 (17%)	112 (15%)	
	Homeless	111 (16%)	100 (13%)	
	Institutional	99 (14%)	74 (10%)	
	Other	126 (18%)	116 (15%)	
Employment status	Employed	61 (9%)	63 (8%)	
	Unemployed	492 (71%)	608 (79%)	$\chi^2(3) = 14.22$, p= .003
	Disabled	132 (19%)	96 (12%)	
	Other	11 (2%)	8 (1%)	
Sexual orientation	Heterosexual	503 (93%)	37 (7%)	$\chi^2(1) = 5.30$, p= .02
	Non-Heterosexual	650 (89%)	77 (11%)	
Ethnicity	Hispanic	44 (6%)	77 (10%)	$\chi^2(1) = 8.28$, p= .004
	Non-Hispanic	693 (94%)	693 (90%)	
Marital status	Single	496 (67%)	574 (75%)	
	Married	45 (6%)	38 (5%)	$\chi^2(2) = 10.21$, p= .01
	Other	195 (27%)	155 (20%)	
Race	White	584 (79%)	603 (78%)	$\chi^2(1) = 0.15$, p= .70
	Non-White	155 (21%)	168 (22%)	
Sex	Male	471 (64%)	509 (66%)	$\chi^2(1) = 0.74$, p= .39
	Female	267 (36%)	263 (34%)	
Veteran	Non-veteran	646 (90%)	696 (93%)	$\chi^2(1) = 2.78$, p= .10
	Veteran	72 (10%)	57 (8%)	

Note. SD = Standard Deviation; X^2 = chi-square distribution. [a]Percentages total greater than 100 due to rounding in each cell.

***Aim 4*: To identify any increase or decrease in individual mental health or substance use disorder diagnoses pre-COVID compared to post-COVID.**

The individuals identified their most used substances, Substance 1, 2, and 3, in the residential program and these were not considered to be statistically significant, see Table 3. Among the pre-COVID group, Substance 1 included two main categories: alcohol (42%) and stimulants (44%). Post-COVID alcohol use as the primary substance changed to 41% and stimulant use stayed at 44%. For those who used two substances, the majority reported use of cannabis, which went from 50% to 46% post-COVID. The two substance use disorder diagnoses that were statistically significant during COVID were nicotine and cocaine. Nicotine use diagnoses went from 16% pre-COVID to 11% post-COVID, $p = .004$. Cocaine use diagnoses went from 11% pre-COVID to 15% post-COVID, $p = .02$. Inferential statistics were not done on the mental health diagnoses due to limitations in the data.

Table 3. Percentage of Substance Use

Items		Pre-COVID (n)	Post-COVID (n)	
Substance 1	Alcohol	296 (42%)	304 (41%)	
	Stimulants	305 (44%)	328 (44%)	$\chi^2(23) = 0.97$, $p = .81$
	Opiates	31 (4%)	40 (5%)	
	Cannabis	69 (10%)	69 (9%)	
Substance 2	Alcohol	90 (20%)	75 (16%)	
	Stimulants	105 (23%)	136 (30%)	$\chi^2(3) = 6.10$, $p = .11$
	Opiates	37 (8%)	38 (8%)	
	Cannabis	228 (50%)	210 (46%)	
Substance 3	Alcohol	48 (27%)	43 (31%)	
	Stimulants	51 (28%)	43 (31%)	$\chi^2(3) = 3.68$, $p = .30$
	Opiates	21 (12%)	8 (6%)	
	Cannabis	57 (32%)	44 (32%)	
Nicotine Dx	0	621 (84%)	690 (89%)	$\chi^2(1) = 8.15$, $p = .004$
	1	118 (16%)	85 (11%)	
Cocaine Dx	0	661 (89%)	661 (85%)	$\chi^2(1) = 5.90$, $p = .02$
	1	78 (11%)	114 (15%)	
Cannabis Dx	0	378 (51%)	398 (51%)	$\chi^2(1) = 0.01$, $p = .94$
	1	361 (49%)	377 (49%)	
Opioid Dx	0	609 (82%)	646 (83%)	$\chi^2(1) = 0.24$, $p = .63$
	1	130 (18%)	129 (17%)	
Alcohol Dx	0	261 (35%)	252 (33%)	$\chi^2(1) = 1.33$, $p = .25$
	1	478 (65%)	523 (68%)	
Amphetamines Dx	0	340 (46%)	342 (44%)	$\chi^2(1) = 0.54$, $p = .46$
	1	399 (54%)	433 (56%)	

Note. Dx = Diagnosis; 0 = Negative for diagnosis, 1 = Positive for diagnosis; χ^2 = chi-square distribution.
[a]Percentages total greater than 100 due to rounding in each cell.
*Mental health diagnoses not included due to limitation in the data.

Discussion

Little research has used the DLA-20 to assess the functioning of individuals with a previous history of mental health and substance use disorder diagnosis during COVID. The demographics of each group did change pre-COVID to post-COVID, which could have accounted for some of the changes. The age of the population became younger from a mean of

40.6 years pre-COVID to a mean of 37.9 years post-COVID. Sex did not change significantly among pre-COVID and post-COVID groups, however, there was a slight increase in male population and slight decrease among the female population post-COVID.

While there was no statistical significance regarding the Discharge or Difference Average DLA Scores, there was a significant difference in the Admission DLA Score. Pre-COVID, the mean DLA-20 score was 3.25 and post-COVID the mean increased to 3.33. These numbers portray that the post-COVID population was entering the residential program with higher scores associated with better functioning than the pre-COVID population. This partially aligned with previous studies that found individuals with schizophrenia being less likely to show an exacerbation of symptoms with the pandemic (Kurose et al., 2022).

Among the Admission DLA-20 domains, there were several that increased significantly post-COVID. Health practices is the ability of an individual to take care of their health needs such as taking medication. This DLA score increased from 2.94 to 3.08. The ability to maintain stable housing, such as cleaning, also known as housing stability/maintenance increased from 2.61 pre-COVID to 2.80 post-COVID. Safety, managing time, managing money, nutrition, leisure, community resources, personal hygiene, and grooming DLA scores increased from pre-COVID to post-COVID. The only score within this category that significantly decreased was with family relationships, which describes the ability to get along with family members and having positive relationships with them. Family relationship DLA scores decreased from 3.60 to 3.40. Previous studies involving COVID's effect on family relationships primarily surround children and adolescents, however, with college students, it was found that 34.1% had strained relationships with their family specifically related to the impact of COVID (Lee et al., 2021).

Among the significant Discharge DLA-20 domains, family relationships were still lower post-COVID going from 4.19 to 3.99. The scores associated with social network and behavior norms also decreased from pre-COVID to post-COVID. However, personal hygiene increased post-COVID from 4.87 to 5.02 as well as grooming, which increased from 5.20 to 5.34 indicating that individuals in the residential program continued to improve their ability to care for themselves regardless of the effects of the pandemic.

Another aim of this study was to analyze the difference in treatment completion and goal completion pre-COVID vs post-COVID. There was a significant decrease in treatment completion and goal outcome pre-COVID compared to post-COVID. Of the pre-COVID individuals, 64% completed treatment, however, this percentage decreased to 57 post-COVID. Those who were in the category of 'treatment not completed' consisted of administrative discharge, chose to decline additional treatment, drop out, death, discharge absent without authority (D/C AWOA), other, incarcerated, and terminated by the facility. 36% did not complete treatment post-COVID and 7% transferred to another facility. Pre-COVID there were more people completing treatment as compared to post-COVID. Of those who completed treatment, more individuals met their goal pre-COVID (61%) compared to post-COVID (57%).

There was statistical significance involving some of the demographics within the residential facility. There were more individuals living in a private setting without support at 48% post-COVID and the homeless population dropped from 17% pre-COVID to 13% post-COVID. This is consistent with the current statistics in Nebraska. In 2022, 2,246 individuals reported experiencing homelessness in Nebraska, which has decreased overall by 6.6% since 2020 (Stebbins, 2023). There was an increase in unemployed individuals from pre-COVID (71%) to post-COVID (79%). Separately, the number of disabled individuals decreased from

19% to 12% post-COVID. Employed individuals remained at 8%. There were a larger number of heterosexual individuals, but this significantly decreased from 93% to 89% and people with non-heterosexual orientation increased to 11% post-COVID. Race was not significantly difference in relation to COVID. Marital status was found to be significantly different with more individuals identifying themselves as single post-COVID. However, it is acknowledged that the way people categorize themselves (single, married, other) may change based on the person and should be considered when reporting this data.

Lastly, the only substance use categories of significant change were nicotine and cocaine. Nicotine use decreased by 5% and cocaine use increased by 4% post-COVID. The mental health diagnoses were collected in the data; however, the resulting data were considered to be a limitation due to a change in the staffing personnel with limiting scope of practice not able to diagnose mental health disorders. This change occurred within 2021.

Conclusion

We conclude that our findings help increase understanding about COVID's effect on individuals with co-occurring disorders undergoing residential treatment and their level of functioning. Within CenterPointe, this population was scoring higher on the DLA prior to admission, alluding to better functioning amidst the pandemic. Some of the results were the opposite of what would have been expected, such as an anticipated increase in homelessness and disability post-COVID due to the financial and physical challenges the pandemic caused. However, as individuals had lower scores in both categories, it could indicate that not only were individuals more resilient throughout the pandemic, but CenterPointe remained successful in their residential treatment program setting their patients up for success regardless of the pandemic.

Significance and Implications

The desired implication is that this project will assist in driving CenterPointe's future residential program modifications and interventions. According to CenterPointe leadership, improvement in DLA-20 scores greater than 0.3 upon comparison of admission and discharge scores indicates sufficient treatment plans within their residential program. DLA-20 score differences of less than 0.3 highlight patient demographics and dual-diagnoses which may benefit from further interventions or program modification in the post-COVID cohorts to aim for improvement in DLA-20 scores.

Limitations

One limitation of this study surrounds the change in mental health diagnoses. Per CenterPointe personnel, there are Licensed Mental Health Professionals (LMHPs) and Provisional Licensed Drug and Alcohol Counselors (P/LADCs) that complete the intake assessment with the individuals prior to residential treatment. The LMHPs can diagnose both mental health and substance use disorders, whereas the P/LADCs only have the ability to diagnose substance use disorders. In 2021, there was a decrease in LMHPs which could have impacted the ability of the staff to diagnose mental health disorders during the post-COVID timeframe of the study. It should also be noted that individuals self-reported some of the data, and therefore some inaccuracies may be included. With the exclusion of individuals that started the residential program in pre-COVID and completed in post-COVID, this could have prevented a different outcome within the results.

Recommendations

Given the increase in Admission Average DLA Score, there could be a need for further research to identify the difference in level of functioning in those with a previous mental health

or substance use disorder diagnosis and the effect of COVID compared to those with no previous history of a mental health or substance use disorder diagnosis. Research may also examine the DLA scores at different residential sites at CenterPointe's Lincoln location and even nationwide to identify significant changes between states. It would also be helpful to conduct another study that includes more data pertaining to mental health diagnoses in this population.

References

Abarna, C.N., Glover, N.I., Morris, P.E., Zvolensky, M.J., & Buckner, J.D. (2021). Functional impairment in response to the COVID-19 pandemic among cannabis users. *Substance Use & Misuse, 56*(14). 2221-2228. https://doi.org/10.1080/10826084.2021.1981389

Centers for Disease Control and Prevention. (2022). *CDC museum COVID-19 timeline.* https://www.cdc.gov/museum/timeline/covid19.html#:~:text=March%2015%2C%202020,restaurants%20and%20bars%20to%20close

Chou, J. L., Noel, J. G., Williams, C., Spruell, S., Nixon, K., Riedel, E., & Zaarur, A. (2022). Residential substance use treatment outcomes for pregnant and postpartum women: Distinct patterns for women enrolled before versus during the COVID-19 pandemic. *Journal of Nursing Scholarship.*https://doi.org/10.1111/jnu.12803

González-Sanguino, C., Ausín, B., Castellanos, M.A., Saiz, J., López-Gómez, A., Ugidos, C., & Muñoz, M. (2020). Mental health consequences during the initial stage of the 1010 coronavirus pandemic (COVID-19) in Spain. *Brain, Behavior, and Immunity, 87*. 172-176. https://doi.org/10.1016/j.bbi.2020.05.040

Kelly, E.L., Reed, M.K., Schoenauer, K.M., Smith, K., Scalia-Jackson, K., Kay Hill, S., Li, E., & Weinstein, L. (2022). A qualitative exploration of the functional, social, and emotional impacts of the COVID-19 pandemic on people who use drugs. *International Journal of Environmental Research and Public Health, 19*(15). Doi: 10.3390/ijerph19159751

Kurose, S., Funayama, M., Shimizu, Y., Mimura, Y., Kudo, S., Ogino, S., & Minura, M. (2022). Symptoms changes in patients with existing psychiatric disorders in the initial phase of the COVID-19 pandemic: Vulnerability of female patients and patients with mood disorders. *Asian Journal of Psychiatry, 68.* https://doi.org/10.1016/j.ajp.2021.102966

Lee, J., Solomon, M., Stead, T., Kwon, B., & Ganti, L. (2021). Impact of COVID-19 on the

mental health of US college students. *BMC Psychology 9*(95). https://doi.org/10.1186/s40359-021-00598-3.

Lugo-Marín, J., Gisbert-Gustemps, L., Setien-Ramos, I., Español-Martin, G., Ibañez-Jimenez, P., Forner-Puntonet, M., Arteaga-Henríquez, G., Soriano-Día, A., Duque-Yemail, J.D., Romas-Quiroga, J.A. (2021). COVID-19 pandemic effects in people with autism spectrum disorders and their caregivers: Evaluation of social distancing and lockdown impact on mental health and general status. *Research in Autism Spectrum Disorders, 87.* https://doi.org/10.1016/j.rasd.2021.101757

McDowell, B. M., Beckman, S., & Fawcett, J. (2023). Created Environment: Evolution of a Neuman Systems Model Concept. *Nursing Science Quarterly*, *36*(1), 89–91. https://doi.org/10.1177/08943184221131975

Scott, R. L., & Presmanes, W. S. (2001). Reliability and Validity of the Daily Living Activities Scale: A Functional Assessment Measure for Severe Mental Disorders. *Research on Social Work Practice*, *11*(3), 373–389. https://doi.org/10.1177/104973150101100306

Stebbins, S. (2023). How Nebraska's homesslessness problem compares to the nation. *Hastings Tribune.*

Substance Abuse and Mental Health Services Administration. (2020). *Key substance use and mental health indicators in the United States*. National Survey on Drug Use and Health. https://www.samhsa.gov/data/sites/default/files/reports/rpt29393/2019NSDUHFFRPDFWHTML/2019NSDUHFFR1PDFW090120.pdf

Substance Abuse and Mental Health Services Administration. (2022). *Co-occurring disorders and other health conditions.* https://www.samhsa.gov/medication-assisted-treatment/medications-counseling-related-conditions/co-occurring-disorders

Twenge, J. M. & Joiner, T. E. (2020). U.S. census bureau-assessed prevalence of anxiety and depression symptoms in 2019 and during the 2020 COVID-19 pandemic. *Depression and Anxiety, 37*(10). 954—956. https://doi.org/10.1002/da.23077

Yuan, Y., Liu, Z.H., Zhao, Y.J., Zhang, Q., Zhang, L., Cheung, T., Jackson, T., Jiang, G.Q., & Xiang, Y.T. (2021). Prevalence of post-traumatic stress symptoms and its associations with quality of life, demographic and clinical characteristics in COVID-19 survivors during the post-COVID-19 era. *Frontiers in Psychiatry.* https://doi.org/10.3389/fpsyt.2021.665507

Appendix A

Figure 1.

Daily Living Activities with Definition

Consumer Name:	**Daily Living Activities (©DLA-20): Adult Mental Health**
Consumer ID:	© W.S. Presmanes, M.A., M.Ed., and R.L. Scott, PhD.

Instructions: Using the scale below, rate how often or how well the consumer independently performed or managed each of the 20 Activities of Daily Living (ADLs) in the community during the last 30 days. If the consumer's level of functioning varied, rate the lower score. Consider impairments in functioning due to physical limitations as well as those due to mental impairments. Do not consider environmental limitations (e.g., "no jobs available"). Strengths are scored >=5 and indicate functioning "within normal limits" (WNL) for that activity. 20 scores are always applicable & valid for Average Composite DLA-20 to correlate with severity of illness index (SI).

1	2	3	4	**5 (WNL)**	**6 (WNL)**	**7 (WNL)**
None of the time; **extremely severe** impairment of problems in functioning; pervasive level of continuous paid supports needed	A little of the time; **severe** impairment or problems in functioning; extensive level of continuous paid supports needed	Occasionally; **serious** to moderately severe impairment or problems in functioning; moderate level of continuous paid supports needed	Some of the time; **moderate** impairment or problems in functioning; low level of continuous paid supports needed	A good bit of the time; **mild** impairment, challenge or problems in functioning; moderate level of intermittent paid supports needed	Most of the time; strength w/very mild impairment or problems in functioning; low level of intermittent paid supports needed	All of the time; independently managed DLA in community; no impairment or problem in functioning requiring paid supports

ACTIVITIES	**Examples of scoring strengths as WNL behaviors (Scores 5-7)**	**Dates:** Eva1	R2	R3	R4	R5
1. Health Practices	Takes care of health issues, manages moods, infections; takes medication as prescribed; follows up on medical appointments.					
2. Housing Stability, Maintenance	Maintains stable housing; organizes possessions, cleans, abides by rules and contributes to maintenance if living with others					
3. Communication	Listens to people, expresses opinions/feelings; makes wishes know effectively.					
4. Safety	Safely moves about community – adequate vision, hearing, makes safe decisions. Safely uses small appliances, ovens/burners, matches, knives, razors, other tools.					
5. Managing Time	Follows regular schedule for bedtime, wake-up, meal times, rarely tardy or absent for work, day programs, appointments, scheduled activities.					
6. Managing Money	Manages money wisely (independent source of funds); controls spending habits.					
7. Nutrition	Eats at least 2 basically nutritious meals daily.					
8. Problem Solving	Resolves basic problems of daily living, asks questions for clarity and setting expectations.					
9. Family Relationships	Gets along with family, positive relationships as parent, sibling, child, significant other family member.					
10. Alcohol/Drug Use	Avoids abuse or abstains from alcohol/drugs, cigarettes; understands signs and symptoms of abuse or dependency; avoids misuse or combining alcohol, drugs, medication.					
11. Leisure	Relaxes with a variety of activities; attends/participates in sports or performing arts events; reads newspapers, magazines, books; recreational games with others; involved arts/crafts; goes to movies.					
12. Community Resources	Uses other community services, self-help groups, telephone, public transportation, religious organizations, shopping.					
13. Social Network	Gets along with friends, neighbors, coworkers, other peers.					
14. Sexuality	Appropriate behavior toward others; comfortable with gender, respects privacy and rights of others, practices safe sex or abstains.					
15. Productivity	Independently working, volunteering, homemaking, or learning skills for financial self-support.					
16. Coping Skills	Knows about nature of disability/illness, probable limitations, and symptoms of relapse; behaviors that cause relapse or make situation/condition worse; makes plans and uses options for coping, improving, preventing relapse, restoring feelings of self-worth, competence, being in control.					
17. Behavior Norms	Complies with community norms, probation/parole, court requirements, if applicable; controls dangerous, violent, aggressive, bizarre, or nuisance behaviors; respects rights of others.					
18. Personal Hygiene	Cares for personal cleanliness, such as bathing, brushing teeth.					
19. Grooming	Cares for hair, hands, general appearance; shaves.					
20. Dress	Dresses self; wears clean clothes that are appropriate for weather, job, and other activities; clothing is generally neat and intact.					

Scoring Instructions: **Step 1.** Add 20 scores from current Review column (R1-R5). **Step 2.** Divide sum by number of activities actually rated to obtain average DLA-20 composite score-keep 2 digits; No N/A, Valid N=20 ADLs! **Step 3.** To validate, use Modified Global Assessment of Functioning (mGAF): multiply the average DLA score by 10 (Standard Error range +/-3 points). Consult the mGAF https://www.dcf.state.fl.us/programs/samh/mentalhealth/mgaf.pdf for the DSM-5 count of serious disturbances. **Step 4:** Consult the **crosswalk** for the ICD-10 Severity of Illness Index (SI).

Sum N=20 (max.140)					
Avg. Composite DLA-20					
Est. count DSM-5 # disturbances					
Severity Index for ICD-10 Modifier					

Appendix B

Figure 2

Daily Living Activities and Explanation of Scores

DAILY LIVING ACTIVITIES (DLA-20™) ANCHORS	1- Extremely severe functional impairment, needs pervasive supports	2- Severe functional impairment, needs extensive supports	3- Serious impairment with serious symptoms; intense supports	4- Moderate impairment; routine, frequent support for DLA	5- WNL/Strength Mild functional impairment, intermittent support	6- WNL-Strength Intermittent mild impairment, needs low level supports	7- WNL-Strength optimal independence with No support
Health Practices: 1-Rate independent self-care for physical (PH) and mental health (MH), including **managing moods**, medications, illness management	Evidence of danger to self/other due to MH; No self-care, evidence of breaks in reality, requires pervasive interventions (e.g.: multiple or lengthy stays in crisis, jail)	Marked limitations in self-care &may have physical complications, extensive help for very severe mental impairments, concern for danger to self/other	Limited self-care & compliance, serious impairments in moods, symptoms, mental status, maybe physical issues prompting continuous help for health care.	Marginal self-care and compliance with health issues or prescriptions, managing moods is moderate problem; requires scheduled low level mental health assistance	Moderately self-sufficient, manages moods but relies on intermittent, some routine assistance or home visits by helping persons, in private or self-help residences.	Independent selfcare, compliant with treatment, meds - minimal support, some assistance ok from family, friends, other helping persons.	Optimally independent in taking care of physical & mental status; makes good health care decisions, no assistance needed in self-care.
Housing Maintenance: 2-Rate current self-sufficiency for living independent, maintaining/getting along in residence, management of household.	Health endangering threat, needs or relies on pervasive supervision in protective environment, dependent – does not manage household, not self-sufficient.	Marked limitations in keeping or maintaining stable housing, e.g., sometimes on street, needs or uses constant assistance, likely in 24/7 supported or protective residences.	Dysfunctional in community housing, unstable, Limited self-sufficiency; e.g., relies on respite, assistance, private or self-help home, may occasionally help in household maintenance.	Stable community housing but housing may be inadequate or s/he may be only marginally self-sufficient, e.g., relies on regular assistance to maintain stable household.	Moderately self-sufficient in independent, private place with routine, low level assistance, (e.g. home visits by helping persons), mostly maintains household by self.	Adequate independence: self-sufficient with minimal assistance in community based, independent housing (e.g. intermittent support from family, friends, others).	Optimal independence: Self-sufficient in community based, independent living with no significant assistance or public support in housing.
Communication: 3-Rate currently effective verbal and nonverbal communication	Not effective: high risk threats or noncommunicative, pervasive dependence	Communication is dysfunctional, blunted or antagonistic with others,	Limited verbal or nonverbal effectiveness in communicating with others &	Not clear about problems, marginal effectiveness in communicat	Moderately effective in communicating with others, using	Adequately effective in communicating with others, minimal	Optimal effectiveness verbally, nonverbally with others, no

		dependent on assistance.	may rely on assistance.	ing with others, uses regular assistance.	routine assistance	need for assistance	assistance needed.
Safety: 4-Rate current maintenance of personal safety (e.g., not suicidal, homicidal, etc.)	Unsafe, Eminent danger to self or other, needs or requires pervasive level of continuous supervision.	Marked limitations in safety around home, community; needs/has extensive level of continuous supervision.	Makes unsafe decisions; "at risk" e.g., abusive or abused, cognitive limitations, needs supervision.	Marginally safe, aware and self-protective, benefits from regular assistance or monitoring.	Moderately safe, good decisions, benefits from routine care-givers (e.g. home visits by helping persons).	Safe decisions; Adequate self-protection with minimal assistance, family, neighbors, friends, others	Optimally safe; alert, takes care of self with no significant assistance from others.
5-**Managing Time:** Rate management of sleep, time, self –direction (e.g., a 7 =optimal sleep 7-9 hrs. average/night)	High risk-aberrant routines or MIA (missing), No management of time; pervasive direction of others.	Marked limitations in routine time management, needs or receives extensive direction by others	Limited, e.g., poor routine management of medications, sleep, mealtimes; might need/use constant direction	Marginally effective, disruptions in routines; uses regular direction, e.g., prompts	Moderately effective time management, benefits from routine direction of others.	Adequate time management, minimal prompts or reliance on direction of others.	Optimal routines for health and wellness; self directive in managing sleep, meds, mealtimes

DAILY LIVING ACTIVITIES (DLA-20™) ANCHORS	1- Extremely severe functional impairment, needs pervasive supports	2- Severe functional impairment, needs extensive supports	3- Serious impairment with serious symptoms; intense supports	4- Moderate impairment; routine, frequent support for DLA	5- WNL/Strength Mild functional impairment, intermittent support	6- WNL-Strength Intermittent mild impairment, needs low level supports	7- WNL-Strength optimal independence with No support
6-Managing Money: Rate independent management of personal finances	No income & no involvement in managing personal or public assisted finances, total dependence on public or institutional help.	Marked limitations in management of personal finances; often involves rep payees or total supervision, very limited $, minimal	Requires help to seek/manage public financial assistance (may have rep. payee for rent); Dependent or minimal participation in managing	Marginally independent in managing personal income, benefits or public assisted finances; often uses help, moderately participates in paying	Moderately independent in managing personal finance (minimum public assistance), min. intermittent assistance from others, significant	Adequately independent in managing independent, personal finance with minimal checks and balances or assistance of others	Optimal independence in managing independent and personal finances

		participation in spending or managing money.	personal finances	day to day rent & expenses.	participation in managing money.		
7-Nutrition: Rate current report of consuming basic diet supporting prescription medications; WNL = independently shops, plans, cooks for nutritional needs	High risk dietary concerns; Does not manage nutritional needs; no participation in meal planning, shopping, and preparation.	Very severe dietary limitations, substantial dependence on continuous assistance, often involves constant supervision; no nutritional meal plans, preparation.	Serious limitations, needs or depends on continuous assistance from others; may eat what is available, limited participation in meal plans, shopping, preparation.	Marginal independence managing nutritional needs 2x/day; often uses assistance, some participation in meal planning, shopping, and preparation.	Moderately independent in meeting nutritional needs 2x/day, benefits from intermittent assistance, but participates in meal planning, shopping & preparation.	Adequately independent in managing nutritional needs with minimal assistance from others in meal planning, shopping, and preparation.	Optimal independence in managing nutritional needs, with no significant assistance from others needed for meal planning, shopping, and preparation.
Problem Solving: 8-Rate independent management of problems of daily living	No problem solving, pervasive needs, clearly approaching health endangering threat, no participation in problem solving; others handle daily living problems	Very severe limitations in problem solving, often involving constant supervision, minimal participation in problem solving.	Serious limitations in meeting day to day needs, problem solving; often needs or relies on assistance, limited participation in treatment related problem solving.	Marginally self sufficient in day to day problem solving, often needs or uses regular assistance, participates in treatment-related problem solving.	Moderately self sufficient in problem solving with routine assistance from others, compliant in treatment-related decision making.	Adequately self sufficient in day to day problem solving with minimal assistance from others.	Optimal and independent problem solving with no significant assistance from others.

Family Relationships: 9-Rate family interactions, (separate from friends) and quality of family relationship	Dysfunctional relationships or deviant behaviors often leading to physical aggression or severe abuse, withdrawn, often rejected by others.	Very dysfunctional relationships within family (e.g. routine duress, unwanted dependency or destructive verbal or physical communication)	Dysfunctional family relationships, often no positive communication or participation with family or significant others	Marginally functional family relationships (i.e. relationships are often stressed or infrequent, superficial, unreliable).	Moderately effective continuing and close relationship with at least one family member or significant other	Adequate personal relationship with one or more family members or significant other	Positive relationship with family/ significant others; assertively contributes to these relationships
DAILY LIVING ACTIVITIES (DLA-20™) ANCHORS	1- Extremely severe functional impairment, needs pervasive supports	2- Severe functional impairment, needs extensive supports	3- Serious impairment with serious symptoms; intense supports	4- Moderate impairment; routine, frequent support for DLA	5- WNL/Strength Mild functional impairment, intermittent support	6- WNL-Strength Intermittent mild impairment, needs low level supports	7- WNL-Strength optimal independence with No support
Alcohol/Drug Use: 10-Rate self-control with addictive drugs including cigarettes; or maintenance of alcohol/drug abstinence	Current abuse or dependence leading to imminent health and safety threats - pervasive substance abuse, no self-control	Current abuse or dependence, may deny substance abuse problem, does not participate in treatment; extremely limited self-control	Current abuse or dependence, acknowledges serious substance abuse problem but shows limited self-control, struggles with treatment plan	Current moderate problem with use, dependence, compliant with treatment, moderate success over alcohol, cigarettes, drugs.	No current use but recent history of abuse/dependence, adequately aware of risks and seeking help, information, support, treatment to continuously sustain success.	Safe use, not smoking or Abstinent with self help groups. May have had history of substance abuse related issue,	No history of substance abuse related problems and Optimal self-control with substances;
11- Leisure: Rate independent participation in leisure activities.	Dependent - No independent participation in leisure activities.	Dependent - min. participation in leisure of any kind without help.	Limited interests or independent participation in leisure activities.	Marginally independent leisure activity participation.	Moderately independent leisure activity participation.	Adequately independent in at least one leisure activity.	Optimal interests, independence with 2 or more leisure activities.

Community Resources: 12-Rate current independent use of health & social services, shopping, transportation.	No independent use of community resources; chronic reliance on helpers to gain access OR adamantly refuses necessary help.	Inappropriate dependence OR unable to be independent with community resources, very reliant on helpers.	Does not seek appropriate supports w/o help; Limited independence with community resources, reliant on help to gain access.	Marginally independent, occasional reliance to gain access to recreational, educational, vocational resource	Moderately independent in use of community resources, intermittent reliance gaining access	Adequate independent use of community resources, minimal need for help in gaining access.	Optimal independent use of community resources, no significant need for help in gaining access.
Social Network: 13-Rate quality of interactions with immediate social network (e.g. close friends not family)	Extremely dysfunctional relationships (i.e. imminent physical aggression involves police or severely withdrawn)	Marked limitations in social network relationships (e.g. excessive dependency or destructive behaviors)	Limited interpersonally, often no significant friendships, socially isolated or avoids and withdraws	Marginal functioning with others (i.e. friendships are often minimal, unreliable, strained)	Moderately effective continuing and close relationship with at least one friend	Adequate interpersonal relationships with one or more friends	Positive relationship with one or more friends; optimally independent with assertively contributions
Sexuality/ Sexual health: 14-Rate mental & physical sexual health, sexually safe & appropriate behaviors	Severely dysfunctional, pervasive high risk, danger to self or others prompts continuous protective supervision	Marked limitations in sexual health & self-care, likely prompts extensive level of protective interventions due to high risk to self or others	Behaviors indicate limited sexual health self-care; risk concerns may prompt extra care, interventions, even supervision if risks appear imminent.	Marginally sufficient in selfcare of sexual heath; minimal understanding of personal or others sexual behavior, issues, inhibitions	Moderately sufficient in sexual health and self-care with routinely helpful education, guidance of others as age appropriate.	Adequate self-care around sexual self & health, self-respect, asking only expected and minimal guidance from others.	Optimal sexual self-care, self respect and respect for partner, no guidance from others needed.

DAILY LIVING ACTIVITIES (DLA-20™) ANCHORS	1- Extremely severe functional impairment, needs pervasive supports	2- Severe functional impairment, needs extensive supports	3- Serious impairment with serious symptoms; intense supports	4- Moderate impairment; routine, frequent support for DLA	5- WNL/Strength Mild functional impairment, intermittent support	6- WNL-Strength Intermittent mild impairment, needs low level supports	7- WNL-Strength optimal independence with No support

15-**Productivity:** Rate functioning primarily in most appropriate expected role (i.e. wage earner, homemaker, employee, student)	Productivity severely limited; often unable to work or adapt to homemaking or school; virtually no attempt to be productive.	Occasional attempts at productivity unsuccessful; no routine or structure at home or in day activities.	Limited productivity; often with currently restricted capabilities for school, independent employment, home making	Marginal productivity with mental distress (e.g. reduced ability to work in sheltered or independent settings)	Moderately functional working in independent job, at home or in school; fluctuates with limited skills, experience.	Adequate functioning, working in independent jobs, home or school; often not applying all available abilities.	Optimally performs employment-related functions, homemaking, or school tasks with ease and efficiency.
16-Coping skills: Rate knowledge <u>and</u> effective use of coping mechanisms.	Pervasive stresses, no mindful use of coping skills approach health endangering threat, needs/requires pervasive supervision	Negative use of coping skills often leading to relapses, crises, involving constant interventions, in or out of protective environment.	Ineffective use of few coping skills prompting regular interventions (e.g. extra contacts, frequent use of over-the-counter medications)	Marginally effective knowledge and use of coping mechanisms; seeks assistance to create or initiate coping mechanisms.	Moderately effective range of coping mechanisms, WNL routine reminders, assistance to initiate coping mechanisms	Effective use of coping mechanisms with only expected, minimal assistance, knows self, acts to reduce stressors and use options to restore confidence.	Optimally effective use of coping mechanisms under various stresses with no significant assistance from others.
17-Behavioral Norms: Rate extended community, social relationships, interaction within community, e.g., court involvement rated <=4	Totally isolated from or evidences severely deviant behaviors (i.e. behavior is overtly disruptive or threatening, may involve criminal justice sanctions)	Often isolated or demonstrates deviant behaviors, e.g., rejected or belligerent to helpers, neighbors; may have serious restrictions by courts/parole.	Limited successful and appropriate interactions, survival level interactions or seriously impaired behaviors, e.g., arrested, restricted by courts/parole	Marginally effective interactions; may be compliant with courts/parole; may receive multiple public system supports in accord with multiple needs	Moderately effective and independent in community interactions; may receive some public support in accord with needs	Adequate positive interactions in resident neighborhood, in one community organization or recreational activity	Independently and Positively interacts in community, church or clubs, recreational activities, hobbies or personal interests, <u>often</u> with other participants

18-Personal Hygiene: Rate independent management of personal hygiene, dental and oral care	No self care - no personal hygiene; evidence indicates health endangering threat, pervasive needs.	High risk or Severe problems with teeth, or in self-care, personal hygiene; health endangered.	Limited self-care of teeth, poor personal, oral hygiene, needs or dependent on assistance.	Marginally self-sufficient in maintaining adequate hygiene, dental-oral health; moderate support	Moderately self-sufficient in maintaining adequate hygiene with routine assistance.	Adequate self-care in maintaining good hygiene; minimal prompts or infrequent assistance	Optimal hygiene functioning, self-sufficient around cleanliness; no issues.
19-Grooming: Rate independent care, groomed hair, hands, general appearance	No personal grooming indicative of high risk, pervasive needs	Marked limitations evident with poorly cleaned hair, hands, self-grooming, serious needs	Limited self-care in grooming, general observations indicate serious impairments.	Marginally self-sufficient in maintaining adequate grooming - regular assistance.	Moderately self-sufficient in grooming with prompts or support - routine assistance.	Adequate self-sufficiency in grooming, minimal assistance needed.	Optimal self-sufficiency in grooming with no issues and no routine assistance.
20-Dress: Rate clean, weather appropriate w/o personal bias	Unclean, undressed - high risk needs due to no self-care	Severe impairment, wearing unclean & inappropriate dress for weather, tasks.	Insufficient clean dress or dress is in poor repair, ill fitting in all weather	Marginally self-sufficient in maintaining clean, appropriate dress,	With periodic support or help, wears clean, appropriate dress,	Adequate self-sufficiency in maintaining clean, appropriate dress,	Optimal self-sufficiency in maintaining clean, appropriate dress;

Appendix C

Table 4
DLA Domains

		N	Mean	SD	*t*	df	*p*-value
Admission							
Health Practices	pre-COVID	737	2.94	0.98	-2.65	1509	.01
	post-COVID	774	3.08	1.05			
Housing Stability, Maintenance	pre-COVID	739	2.61	1.02	-3.65	1511	<.001
	post-COVID	774	2.80	1.03			
Communication	pre-COVID	736	3.34	0.89	0.15	1506	.88
	post-COVID	772	3.33	0.83			
Safety	pre-COVID	731	2.80	0.93	-3.63	1503	<.001
	post-COVID	774	2.98	0.97			
Managing Time	pre-COVID	735	2.81	0.94	-3.10	1504.32	.002
	post-COVID	773	2.96	0.96			
Managing Money	pre-COVID	732	2.65	1.16	-2.18	1472.62	.03
	post-COVID	774	2.78	1.06			
Nutrition	pre-COVID	737	3.05	0.97	-0.27	1510	.01
	post-COVID	775	3.18	0.93			
Problem Solving	pre-COVID	737	2.99	0.84	1.86	1509	.06
	post-COVID	774	2.91	0.87			
Family Relationships	pre-COVID	732	3.60	1.09	3.77	1502	<.001
	post-COVID	772	3.40	1.02			
Alcohol/Drug Use	pre-COVID	724	3.11	1.43	0.27	1425.63	.79
	post-COVID	774	3.09	1.22			
Leisure	pre-COVID	726	2.82	1.05	-3.68	1456.1	<.001
	post-COVID	771	3.01	0.95			
Community Resources	pre-COVID	731	2.95	0.92	-2.56	1462.7	.01
	post-COVID	773	3.07	0.82			
Social Network	pre-COVID	734	3.03	0.88	0.14	1505	.89
	post-COVID	773	3.02	0.87			
Sexuality	pre-COVID	613	3.82	1.01	-1.55	1215	.12
	post-COVID	604	3.93	1.06			
Productivity	pre-COVID	736	2.71	1.04	-1.10	1467.4	.27
	post-COVID	771	2.77	0.93			
Coping Skills	pre-COVID	738	2.64	0.88	-1.28	1510	.20
	post-COVID	774	2.69	0.89			
Behavior Norms	pre-COVID	734	3.31	0.95	1.98	1504	.05

	post-COVID	772	3.22	0.93			
Personal Hygiene	pre-COVID	736	4.12	1.26	-4.15	1508.3	<.001
	post-COVID	775	4.39	1.30			
Grooming	pre-COVID	737	4.53	1.20	-3.51	1509.82	<.001
	post-COVID	775	4.76	1.27			
Dress	pre-COVID	737	4.91	1.19	-0.42	1509	.67
	post-COVID	774	4.94	1.21			
Discharge							
Health Practices	pre-COVID	739	3.79	1.12	-1.06	1511	.29
	post-COVID	774	3.85	1.12			
Housing Stability, Maintenance	pre-COVID	739	3.40	1.23	-0.54	1511	.59
	post-COVID	774	3.44	1.16			
Communication	pre-COVID	738	4.08	1.20	-1.00	1487.37	.32
	post-COVID	773	4.02	1.11			
Safety	pre-COVID	732	3.76	1.16	-0.96	1504	.34
	post-COVID	774	3.81	1.20			
Managing Time	pre-COVID	738	3.66	1.25	-1.56	1495.31	.12
	post-COVID	774	3.76	1.19			
Managing Money	pre-COVID	708	3.24	1.34	0.02	1481	.98
	post-COVID	775	3.24	1.33			
Nutrition	pre-COVID	739	3.70	1.19	-1.64	1484.48	.10
	post-COVID	775	3.80	1.09			
Problem Solving	pre-COVID	738	3.73	1.11	0.25	1511	.81
	post-COVID	775	3.72	1.13			
Family Relationships	pre-COVID	733	4.19	1.16	3.27	1505	.001
	post-COVID	774	3.99	1.19			
Alcohol/Drug Use	pre-COVID	702	3.96	1.22	-1.37	1474	.17
	post-COVID	774	4.05	1.17			
Leisure	pre-COVID	735	3.61	1.29	-1.72	1465.75	.09
	post-COVID	774	3.72	1.15			
Community Resources	pre-COVID	739	3.68	1.16	-0.93	1493.15	.36
	post-COVID	772	3.74	1.10			
Social Network	pre-COVID	739	3.81	1.20	2.21	1490.68	.03
	post-COVID	771	3.68	1.13			
Sexuality	pre-COVID	632	4.36	1.07	-0.89	1233	.38
	post-COVID	603	4.41	1.12			
Productivity	pre-COVID	739	3.54	1.31	0.67	1486.73	.51
	post-COVID	773	3.50	1.21			

Coping Skills	pre-COVID	737	3.77	1.26	0.07	1510	.95
	post-COVID	775	3.77	1.22			
Behavior Norms	pre-COVID	737	4.06	1.17	2.34	1510	.02
	post-COVID	775	3.92	1.16			
Personal Hygiene	pre-COVID	739	4.87	1.44	-2.05	1489.85	.04
	post-COVID	775	5.02	1.34			
Grooming	pre-COVID	737	5.20	1.26	-2.08	1495.55	.04
	post-COVID	775	5.34	1.20			
Dress	pre-COVID	737	5.54	1.13	1.14	1509	.25
	post-COVID	774	5.48	1.12			

Note. Standard Deviation (SD)