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Evaluation of a Youth Emergency Room Enhancement Program for Behavioral Health

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### Abstract

*Problem.* Pediatric mental health complaints and subsequent hospitalizations have been steadily increasing. The Behavioral Health Network (BHN) developed an intensive outreach case management program aimed at reducing youth mental health emergency department (ED) visits and inpatient psychiatric admissions. The Youth Emergency Room Enhancement (YERE) program was a process improvement initiative to provide immediate case management to youth and caregivers for mental health care.

*Methods.* A Plan-Do-Study-Act (PDSA) method utilizing a retrospective case record review occurred over a six-month period. A convenience sample of youth aged 6-20 years presenting to one of eight healthcare facilities for either ED or inpatient hospitalization with a mental health complaint or diagnosis was selected.

*Results.* Twenty-four subjects ( $N=24$ ) were enrolled with the three most common diagnoses being Major Depressive Disorder (45.8%,  $n = 11$ ), Attention Deficit Hyperactivity Disorder (37.5%,  $n = 9$ ), and Post-Traumatic Stress Disorder (25%,  $n = 6$ ). The pre-YERE rate of ED and inpatient admissions was 2.96, which decreased to 2.00 post-YERE. In addition, ED visits decreased by 42.55% and inpatient psychiatric admissions decreased by 12.5% post-YERE enrollment. Those with Medicaid (71%) were more likely to be enrolled in the program. Zip code was found to be a predictor of admissions post-YERE enrollment ( $p < .001$ ).

*Implications for Practice.* The YERE program reduced ED and inpatient psychiatric admissions for youth. Zip codes could be used to predict areas of future program focus. More study is needed to determine why Medicaid patients were more likely to be enrolled.

### Evaluation of a Youth Emergency Room Enhancement Program for Behavioral Health

Nearly 5% of all pediatric Emergency Department (ED) visits in the United States are because of mental health complaints (Cooper & Masi, 2007). Between 2006 and 2015 in Missouri there was a 42% increase in mental health hospitalizations for patients between the ages of 14- and 17-years, the majority of whom entered the hospital system through the ED (Hospital Industry Data Institute, 2016). Feng, Toomey, Zaslavsky, Nakamura, and Schuster (2017) found 18.7% of admissions for 5- to 17-year olds across 22 states at acute care hospitals were for a mental health diagnosis. Not only has there been an increase in the first-time pediatric visits to EDs for mental health complaints, but there has also been an increase in readmissions for this population based on a mental health diagnosis. In addition, Feng et al. (2017) found the 30-day readmission rate for youth admitted for a mental health diagnosis was higher (8.0%) than for non-mental health reasons (6.2%).

Assertive Community Treatment (ACT) programs are a form of an intensive outreach programs found to be effective in adults resulting in decreased ED visits and inpatient admissions, but there is limited data available on the efficacy of their use with youth (Nakhost, Law, Pridham, & Stergiopoulos, 2017). Another type of intensive outreach program for adults with mental illness are intensive case management (ICM) programs, serving more patients who have less acute needs than those in ACT programs (Nakhost et al., 2017). Nakhost et al. (2017) described the need for flexibility in the intensity of case management based on patient needs. In the Netherlands, the Flexible Assertive Community Treatment (FACT) model of care was developed. In this model, patients transitioned between an ACT and ICM level of case management maintaining

the same case manager (Nakhost et al., 2017). FACT programs were further modified and studied in Canada but was only offered to adult patients (Nakhost et al., 2017).

A version of an ACT program, called Assertive Community Treatment for Transitional Age Youth (ACT-TAY) has been developed in the United States and is provided in the Midwest; however, it is utilized solely to treat youth with a mental diagnosis that includes psychoses (Missouri Department of Mental Health, 2015). In 2015, the Behavioral Health Network (BHN) of Greater St. Louis developed an adult Emergency Room Enhancement (ERE) Program. This program provided on-site evaluation upon referral and utilized coordination of care to community-based services while integrating the use of flexible funding to address financial barriers to client engagement in services (BHN, 2014). This adult program resulted in a 90% engagement rate, a 67% reduction in hospitalizations, and a 71% reduction in ED visits (BHN, 2014). Most recently, the BHN has developed the Youth Emergency Room Enhancement (YERE) program targeting youth mental health ED visits, hospital admissions and readmissions. This program targets high-risk and difficult to engage youth between ages 6- to 18- years (20 years old if still in high school). This program provides intensive mobile outreach case management services to the youth and their caregivers and attempts to identify and overcome barriers to mental health care while increasing access to mental health providers in the community including Community Mental Health Centers (CMHC). This program provides each case with a case manager, a Peer Specialist (a specially trained parent of a child who has a mental health diagnosis), and access to providers in a CMHC within their geographic area if needed. The primary objective of

the YERE program is to reduce pediatric mental health ED visits and inpatient admissions. The program was piloted in Fall 2017 to Spring 2018.

The purpose of this process improvement initiative was to obtain baseline data from implementing the YERE pilot program. The pilot study included youth aged 6- to 20-years residing in seven selected Midwestern counties who had a mental health complaint or diagnosis. The timeframe for study was three-months prior to YERE program enrollment compared with three-months after enrollment. The study questions were:

1. What (if any) change was there in the number of ED visits?
2. What (if any) change was there in number of inpatient psychiatric admissions?
3. What were the most common diagnoses?
4. What was the rate of admitted or documented substance use?

### **Literature Review**

A search between 2007 and 2017 used the databases of Google Scholar, PubMed and PsychINFO. Search terms included: intensive outreach case management, intensive outreach, case management, youth OR children, mental health OR psych, mental illness, levels of care AND case management, high risk youth AND engagement AND mental health, difficult to engage youth AND intensive outreach AND mental health. Inclusion criteria were 6- to 20-years of age, intensive outreach and/or case management programs, studies from any country published in English, and studies related to mental health or mental illness. Exclusion criteria were studies published before 2007, did not include intensive outreach or case management programs, studies published only in a language

other than English, studies with no mention of mental health or mental illness. Twenty publications were reviewed and 13 met inclusion criteria for review.

Snowden, Masland, Libby, Wallace, and Fawley (2008) found children with racial/ethnic minority factors were at increased risk for using the ED for mental health care. Snowden et al. (2008) studied 351,174 children in California and found African-American children had a greater likelihood than Caucasian children to use both community-based crisis intervention services and hospital-based crisis stabilization services. Although African-American, Asian American/Pacific Islander, and American Indian/Alaska Native youth had higher use than Caucasian youth in a hospital based psychiatric stabilization service such as the ED, the use between Latino and Caucasian youth was insignificant (Snowden et al., 2008). Additionally, Snowden et al. (2008) reported children who resided in foster care had a higher likelihood of needing mental health services. Interestingly, American Indian/Alaska Native and African-American youth were more likely to live in foster care than other racial and ethnic groups (Snowden et al., 2008). Also notable was youth living in kinship foster care were found to have received less treatment for mental illness than those in other types of foster care (Snowden et al., 2008).

Newton et al. (2012) found First Nation youth in Canada and those living in families who received government subsidies had significantly more visits to the ED for mental health crisis than other demographic groups. Socioeconomic factors highly predicted the likelihood of return to the ED for follow-up mental health care compared to the use of community mental health services (Newton et al., 2012). Newton et al. (2012) stated “factors such as stigma and discrimination, single-parenthood and parent

unemployment are all linked with service use and should be a priority for understanding predictors of the time to and use of mental health care” (p. E673).

Schley, Yuen, Fletcher, and Radovini (2012) found higher patient engagement predicted better treatment outcomes in high-risk, difficult to engage youth. In Australia, the Intensive Mobile Youth Outreach Services (IMYOS) Program was developed to address youth mental health needs (Purcell et al., 2011). One IMYOS team, called the Adolescent Intensive Management (AIM) team, provided services to the highest risk cases with a higher level of care than other IMYOS teams (Assan et al., 2008). Patients referred to the AIM team included those who needed intensive transitional support; an unwillingness to attend appointments; difficulties in managing systemic complexities by outpatient clinicians; and/or the need for alternative family intervention and support instead of office-based family therapy (Assan et al., 2008).

Additionally, AIM patients tended to have comorbid mental health conditions with 27.1% having two mental health diagnoses and 61.4% having three (Assan et al., 2008). These patients were deemed “high-risk” relative to the level of risk of harm to self or others and who had increased levels of a history of abuse, neglect, and unstable housing (Assan et al., 2008; Schley et al., 2008; Schley et al., 2012). In all IMYOS teams, 36% of patients reported a history of one or more suicide attempts and 63% engaged in substance abuse (Schley et al., 2008). Intensive outreach programs such as IMYOS were found to be especially useful to engage high-risk, difficult to engage youth into community mental health programs (Schley et al., 2008; Schley, Radovini, Halperin, & Fletcher, 2011; Schley et al., 2012).



Early intervention with high-risk, difficult to engage youth in an intensive outreach program format seems to be an effective strategy and may be key to patient success in future community-based treatment (McGorry, Bates, & Birchwood, 2013; Schley et al., 2008). In a large Midwestern city, there was an estimated 17,296 youth between ages 13- to 18-years with mental illness that severely impacted their functioning (Noel, Riedel, O'Neill, Grailer, Hughes, & Luo, 2014). Purcell et al. (2011) reported the aim of early intervention is to prevent or delay the onset of serious mental illness and minimize the damage to activities of daily living. Early intervention has the goal of reducing the risk of crisis onset and the level of chronicity of a youth's mental illness. Without treatment, risk of crisis and chronicity increases as the child ages (Purcell et al., 2011).

Caseload size may affect patient outcomes. For the pediatric population, Assan et al. (2008) found caseload size was low when working with higher risk, more difficult to engage patients. For the IMYOS programs, caseloads ranged from eight to nine patients, but were sometimes fewer depending on case demands (Ryall et al., 2008; Schley et al., 2011). For the AIM team, each clinician had a caseload of six to ten patients (Assan et al., 2008). Adult intensive outreach programs had differing caseloads with the ICM programs having about 20 patients, ACT programs with about 10, and the FACT program having between 13-22 patients per case manager (Nakhost et al., 2017).

McGorry et al. (2013) noted the importance of having a youth friendly, stigma free culture of care and providing a choice in programs and treatment plans. They reported engaging with youth in schools, at home, and using media as effective means of communication (McGorry et al., 2013). Authors cited the importance and benefit of a

youth focused intensive outreach program offering a 24-hour, seven-day a week triage assessment and crisis response line, such as the Youth Access Team (YAT) in Australia (McGorry et al., 2013; Purcell et al., 2011).

Developing a strong therapeutic relationship between the youth and their case manager was found to be an essential component of engaging high-risk, difficult to engage youth (Schley et al., 2011; Schley et al., 2012). Schley et al. (2012) suggested a baseline biopsychosocial assessment may take between six and eight weeks to complete but enhances the establishment of a trusting rapport with the patient. The authors found patients were more likely to be active participants in treatment when they had trust with their case worker, felt that their treatment was useful, and felt they had influence over their own treatment (Schley et al., 2012). Likewise, Purcell et al. (2011) identified when patients believed staff understood them and they were treated with respect and dignity, increased communication about their problems occurred.

In summary, an intensive outreach program modeled after the IMYOS program might result in improved outcomes for youth who are considered high-risk and difficult to engage (Assan et al., 2008; McGorry et al., 2013; Schley et al., 2008). Key characteristics that most influenced outcomes from an intensive outreach program included small caseload sizes, taking six to eight weeks for a baseline assessment, developing a strong therapeutic rapport between case managers and patients, providing choice in treatment, and meeting them in non-stigmatizing locations (Assan et al., 2008; McGorry et al., 2013; Purcell et al., 2011; Schley et al., 2011; Schley et al., 2012). Additionally, tailoring program enrollment efforts to encourage minority populations, families receiving government subsidies and youth living in foster care to

enroll in the YERE program should be considered in efforts to reduce the use of the ED for mental health crisis care (Newton et al., 2012; Snowden et al., 2008).

Gaps identified in the literature included a lack of adult or pediatric intensive outreach programs being studied in the United States. Additionally, intensive outreach programs in multiple locations have not been frequently studied. Lastly, there was no information found on transitioning youth patients between higher and lower levels of case management care while maintaining continuity of care such as was found with the adult patients.

## **Method**

### **Design**

This was a pilot study for a process improvement initiative. A Plan-Do-Study-Act (PDSA) design utilizing a cohort sample of youth with mental health diagnoses enrolled in the YERE program was used. The program began implementation on July 1, 2017. The YERE Program, obtained referrals from eight hospital EDs, psychiatric inpatient units, and clinics available in the selected study area. A retrospective case record review from October 1, 2017 through April 30, 2018 was completed.

### **Setting**

A large Midwestern area, consisting of seven counties including urban, suburban, and rural areas served by the BHN was the setting for this project. The overall population of the area was 2.12 million residents with up to 25.7% under the age of 18 years (United States Census Bureau (USCB), 2016a; USCB, 2016b; USCB, 2016c; USCB, 2016d; USCB, 2016e; USCB, 2016f; USCB, 2010; Data USA, 2015). A large proportion of this population (up to 27.1%) were living below the poverty line (USCB,

2016a; USCB, 2016b; USCB, 2016c; USCB, 2016d; USCB, 2016e; USCB, 2016f; USCB, 2010; Data USA, 2015). Within the seven counties served by the YERE Program, there were 30 hospital facilities, with a total of 821 beds available for inpatient psychiatric care (Missouri Department of Health, 2017). However, of the available hospitals, only five (16%) have child or adolescent psychiatric beds with less than 100 of these beds available (Missouri Department of Health, 2017).

### **Sample**

A convenience sample of patients aged 6- to 20-years who were referred to the YERE Program by one of eight partner referral sources including: St. Louis Children's Hospital, the SPOT COACH Clinic, SSM Health-Cardinal Glennon Children's Hospital, Mercy Hospital-St. Louis, Mercy Hospital-Jefferson City, Mercy Hospital-St. Anthony's Medical Center, SSM Health-DePaul Health Center, and SSM Health-St. Joseph's Health Center-Wentzville as well as Community Mental Health Liaisons (CMHL). Inclusion criteria for the YERE Program included: youth aged 6- to 20-years, significant behavioral health needs (high-risk emotional disorders or substance use disorder), resident in or presenting as homeless in the region of study, not currently engaged in community behavioral health care, not active within a CMHC, or unlikely to easily engage in traditional services and referred from one of the listed referral sources. Exclusion criteria included: less than 6-years or greater than 20-years of age, residence in or referred from outside of the defined study region, did not have high-risk behavioral health needs, currently engaged with a CMHC, engaged with traditional mental health services, or not referred by one of the named referral sources.

**Approval Process**

Approval for this process improvement pilot study was obtained by the BHN of Greater St. Louis. Institutional Review Board (IRB) approval was obtained by the University of Missouri-St. Louis.

**Data Collection and Analysis**

All data was collected via a retrospective case record review. Demographic data including age, gender, race, housing status, zip code, and payor status was obtained. In addition, number of ED visits and inpatient psychiatric admissions for three months prior to YERE Program enrollment, primary mental health diagnosis, and substance use was recorded. Additionally, the number of readmissions to both ED and inpatient psychiatric units within three-months post-enrollment was recorded. Data was stored on a password-protected computer owned by the primary investigator. All data was de-identified and coded with a randomly generated subject ID. Paired t-test, Wilcoxon signed-rank test and multiple regression analysis was used to assess the data. Data was analyzed using SPSS version 25.

**Procedures**

A team of key stakeholders included BHN Program Managers, representatives from each CMHC, representatives from each referral source, Community Mental Health Liaisons, Children's Division, Juvenile Courts, and the Missouri Department of Mental Health. The stakeholders met monthly beginning in July 2017. Meetings with all referral sources occurred prior to program enrollment which began in September 2017. The planning included development of the referral form and other case record documentation forms. The referral sources called an already established Behavioral Health

Response/Youth Connection Helpline to assist with completion of referral forms. If a patient met criteria for the program, the YERE Lead Case Manager who completed the Youth Referral Form and Brief Assessment Form contacted the youth or care giver. The YERE Lead Case Manager then assigned the youth to a YERE Case Manager who completed a Baseline Form within 48 hours. At 30 days, the YERE Case Manager completed the Youth 30-Day Follow-up Form and at three months, the Three-Month Follow-Up Form was completed. Data was then entered into the BHN's data management system.

### **Results**

The total enrollment of the YERE Program between October 1, 2017 and April 30, 2018 was 68, however, only 24 participants had reached three months post-enrollment in the program ( $N=24$ ). The mean age was 14.13 years old ( $sd = 3.603$ ) with the youngest being seven-years old and the oldest 20 years. Additionally, 41.7% ( $n = 10$ ) of the sample identified as female, 54.2% ( $n = 13$ ) as male, and 4.2% ( $n = 1$ ) as transgender. Race analysis demonstrated 45.5% ( $n = 11$ ) were Caucasian, 41.7% ( $n = 10$ ) were Black or African American, 8.3% ( $n = 2$ ) as Other, and 4.2% ( $n = 1$ ) declined to answer. Housing status included 54.2% ( $n = 13$ ) of youth lived with their parents, 12.5% ( $n = 3$ ) lived with other relatives, 16.7% ( $n = 4$ ) lived in a foster home, 4.2% ( $n = 1$ ) lived with friends, and 12.5% ( $n = 3$ ) identified that they were homeless. Payor status revealed 70.8% ( $n = 17$ ) of participants had Medicaid, 16.7% ( $n = 4$ ) had private insurance, 4.2% ( $n = 1$ ) were uninsured, and 8.3% ( $n = 2$ ) had a Medicaid application in progress. The referral sources included 37.5% ( $n = 9$ ) referred by Mercy Hospital-St. Anthony's Medical Center, 16.7% ( $n = 4$ ) from SSM Health-DePaul Hospital, 16.7% ( $n = 4$ ) from

SSM Health-Cardinal Glennon Children's Hospital, 8.3% ( $n = 2$ ) from St. Louis Children's Hospital, 8.3% ( $n = 2$ ) the SPOT Clinic, 8.3% ( $n = 2$ ) from CMHL, and 4.2% ( $n = 1$ ) from SSM Health-St. Joseph's Hospital-Wentzville (Appendix A).

A paired-sample  $t$  test was used to analyze of the means of ED admission, inpatient psychiatric admission, and the combination of ED and inpatient psychiatric admissions. The pre-YERE ED visits slightly decreased from 1.96 ( $sd = 1.829$ ) to 1.13 ( $sd = 1.227$ ) post-YERE implementation. The difference between the two means was not statistically significant at the .05 level ( $t = 1.964$ ,  $df = 23$ ). Pre-YERE inpatient psychiatric admissions slightly decreased from 1 ( $sd = 1.180$ ) to 0.88 ( $sd = 0.947$ ) post-YERE implementation. The difference between the two means was also not statistically significant at the .05 level ( $t = 0.421$ ,  $df = 23$ ). Finally, the pre-YERE combined ED and inpatient psychiatric admission decreased from 2.96 ( $sd = 2.579$ ) to 2 ( $sd = 2.064$ ) post-YERE implementation. The difference between the two means was not statistically significant at the .05 level ( $t = 1.457$ ,  $df = 23$ ) (Appendix B). Due to the small sample size a Wilcoxon signed rank test was also completed. The median of ED admission, inpatient psychiatric admissions, and the combination of ED and inpatient psychiatric admissions was also not found to be statistically significant ( $V = 140.50$ ,  $z = -1.33$ ,  $p = .182$ ).

The primary mental health diagnoses revealed 45.8% ( $n = 11$ ) had a diagnosis of Major Depressive Disorder, 37.5% ( $n = 9$ ) had a diagnosis of Attention Deficit Hyperactivity Disorder, and 25% ( $n = 6$ ) had a diagnosis of Post-Traumatic Stress Disorder (Appendix C). In addition, each subject had at least one mental health diagnosis, 41.7% ( $n = 10$ ) had two diagnoses, 29.2% ( $n = 7$ ) had three diagnoses, and

12.5% ( $n = 3$ ) had four or more diagnoses. Inquiry regarding substance use revealed 41.7% ( $n=10$ ) had comorbid substance use (Appendix D).

A multiple regression was run to predict number of ED and inpatient psychiatric admissions at three months post enrollment from age, gender, zip code, race, insurance status, housing status, substance use history, and number of diagnoses. There was linearity as assessed by partial regression plots and a plot of studentized residuals against the predicted values. There was independence of residuals, as assessed by a Durbin-Watson statistic of 1.843. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. There was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1. There was only one studentized deleted residual greater than  $\pm 3$  standard deviations, which was found to be 4.955 standard deviations and was determined to not be an outlier of enough significance to exclude it from this already small sample. There were no leverage values greater than 0.2 and no values for Cook's distance above 1. The assumption of normality was met, as assessed by both a P-P Plot and Q-Q Plot.

The multiple regression model predicted the number of ED and inpatient psychiatric admissions combined at three months post YERE Program enrollment,  $F(9, 14) = 9.813, p < .001$ . The  $R^2$  for the overall model was 86.3% with an adjusted  $R^2$  of 77.5%, which is considered a large size effect. Only one variable, zip code, was found to be statistically significantly predictive in this model ( $p < .001$ ) while age, the number of days in the YERE Program, gender, race, number of mental health diagnoses, housing status, insurance status, and number of substances used were not found to be statistically significantly predictive (Appendix E).



### Discussion

Results of the YERE pilot study found decreased numbers of youth presenting to the ED, inpatient psychiatric admission or both over a three-month period. While not statistically significant, there was a 42.55% decrease in the number of ED admissions and a decrease of 20 inpatient admissions from the ED post-YERE Program enrollment. In addition, a 12.5% ( $n=3$ ) decrease in the number of inpatient psychiatric admission was found. The YERE Program does appear to effectively reduce the number and rate of ED and inpatient psychiatric admissions for high risk, difficult to engage youth ages 6- to 20-years of age who utilized the ED for mental health care instead of Community Mental Health Centers in the seven-county areas in which the YERE Program is currently available. The three most common admitting diagnoses were Major Depressive Disorder (45.8%,  $n = 11$ ), Attention Deficit Hyperactivity Disorder (37.5%,  $n = 9$ ), and Post-Traumatic Stress Disorder (25%,  $n = 6$ ). The rate of admitted or documented substance use was 41.7% of participants.

One limitation to this study is the small sample size and time constraints that did not include the full pilot period of the program. Continued data analysis at three months post program enrollment is recommended. This study also indicated zip code was a statistically significantly predictor of the number of combined ED and inpatient psychiatric admissions at three months post-YERE Program enrollment and could be used as an indicator of geographic need for future program focus. The participants with the top five greatest number of combined ED and inpatient psychiatric admissions at three months post-YERE Program enrollment resided in the following zip codes: 63385 ( $n = 7$  admissions), 63026 ( $n = 6$ ), 63107 ( $n = 6$ ), 63070 ( $n = 4$ ), and 63049 ( $n = 4$ ).

Certain zip codes could potentially have additional barriers to access to care such as transportation, neighborhood violence, poverty, distance to pharmacies, mental health providers, and other social determinants of health. This could lead to higher use of mental health crisis stabilization with ED and inpatient psychiatric admissions as opposed to use of traditional mental health care services through Community Mental Health Centers.

### **Conclusion**

Overall, the results of this outcome evaluation of the pilot year of the YERE Program indicated the program may be successful at reducing ED and inpatient psychiatric admissions. Additionally, future analysis of the outcome data with a larger sample size with the use of a multiple regression analysis is recommended to identify other factors besides zip code which may be predictive of ED use and inpatient psychiatric admissions post YERE enrollment. Use of zip codes could help the YERE Program better serve those participants living in geographic areas with considerations for additional social determinants of health factors creating additional barriers in accessing mental health care. Programs such as YERE may enhance the care delivered to youth with mental health care needs and prevent severe disease as they become adults.

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## Appendix A

Table 1

*Demographic Data (N=24)*

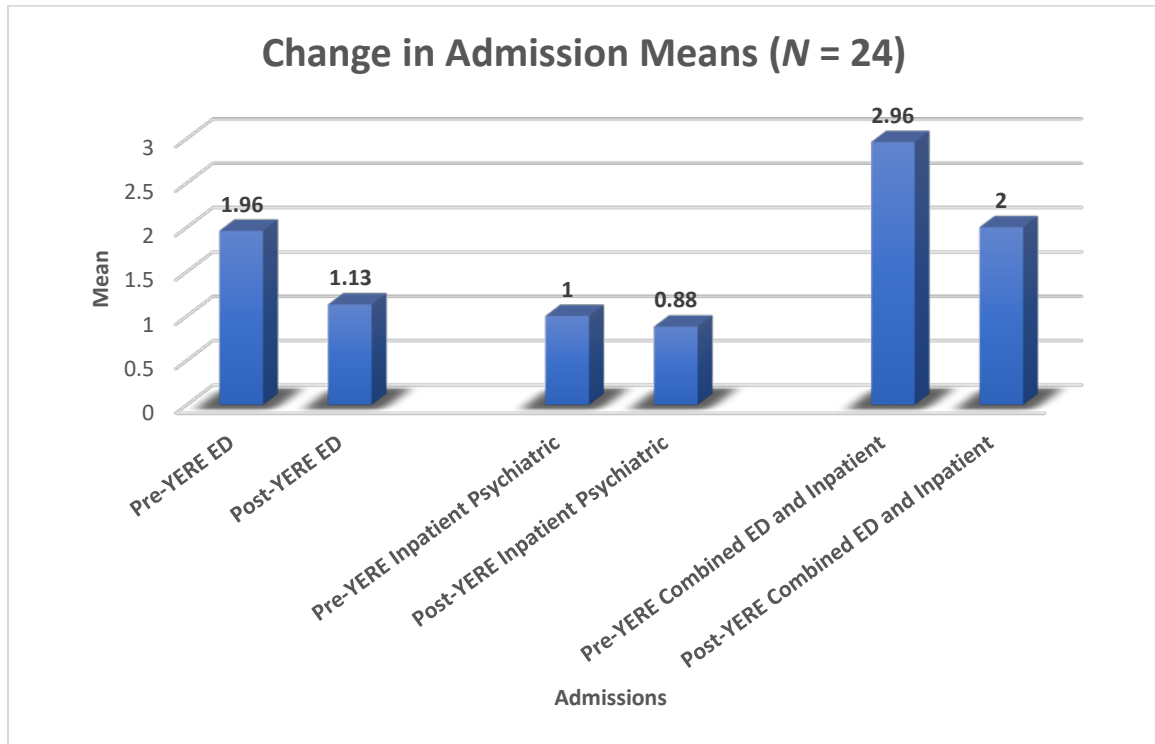
| <b><u>Gender</u></b>                 | <b><u>Number (n)</u></b> | <b><u>Percentage</u></b> |
|--------------------------------------|--------------------------|--------------------------|
| Female                               | 10                       | 41.7%                    |
| Male                                 | 13                       | 54.2%                    |
| Transgender                          | 1                        | 4.2%                     |
| <b><u>Race</u></b>                   |                          |                          |
| <b><u>Race</u></b>                   | <b><u>Number (n)</u></b> | <b><u>Percentage</u></b> |
| Caucasian                            | 11                       | 45.5%                    |
| Black or African American            | 10                       | 41.7%                    |
| Other                                | 2                        | 8.2%                     |
| Declined to Answer                   | 1                        | 4.2%                     |
| <b><u>Housing Status</u></b>         |                          |                          |
| <b><u>Housing Status</u></b>         | <b><u>Number (n)</u></b> | <b><u>Percentage</u></b> |
| Living with Parents                  | 13                       | 54.2%                    |
| Living with Other Relatives          | 3                        | 12.5%                    |
| Living in a Foster Home              | 4                        | 16.7%                    |
| Living with Friends                  | 1                        | 4.2%                     |
| Homeless                             | 3                        | 12.5%                    |
| <b><u>Insurance Status</u></b>       |                          |                          |
| <b><u>Insurance Status</u></b>       | <b><u>Number (n)</u></b> | <b><u>Percentage</u></b> |
| Medicaid                             | 17                       | 70.8%                    |
| Private Insurance                    | 4                        | 16.7%                    |
| Uninsured                            | 1                        | 4.2%                     |
| Medicaid Application in Process      | 2                        | 8.3%                     |
| <b><u>Referral Source</u></b>        |                          |                          |
| <b><u>Referral Source</u></b>        | <b><u>Number (n)</u></b> | <b><u>Percentage</u></b> |
| Mercy St. Anthony's Medical Center   | 9                        | 37.5%                    |
| SSM Health DePaul Hospital           | 4                        | 16.7%                    |
| SSM Health Cardinal Glennon          | 4                        | 16.7%                    |
| St. Louis Children's Hospital        | 2                        | 8.3%                     |
| The SPOT Clinic                      | 2                        | 8.3%                     |
| Community Mental Health Liaisons     | 2                        | 8.3%                     |
| SSM Health St. Joseph's (Wentzville) | 1                        | 4.2%                     |
| Mercy St. Louis                      | 0                        | 0%                       |
| Mercy Jefferson City                 | 0                        | 0%                       |



## Appendix B

Figure 1

*Comparison Between Pre-YERE and Post-YERE ED and Inpatient Admissions*

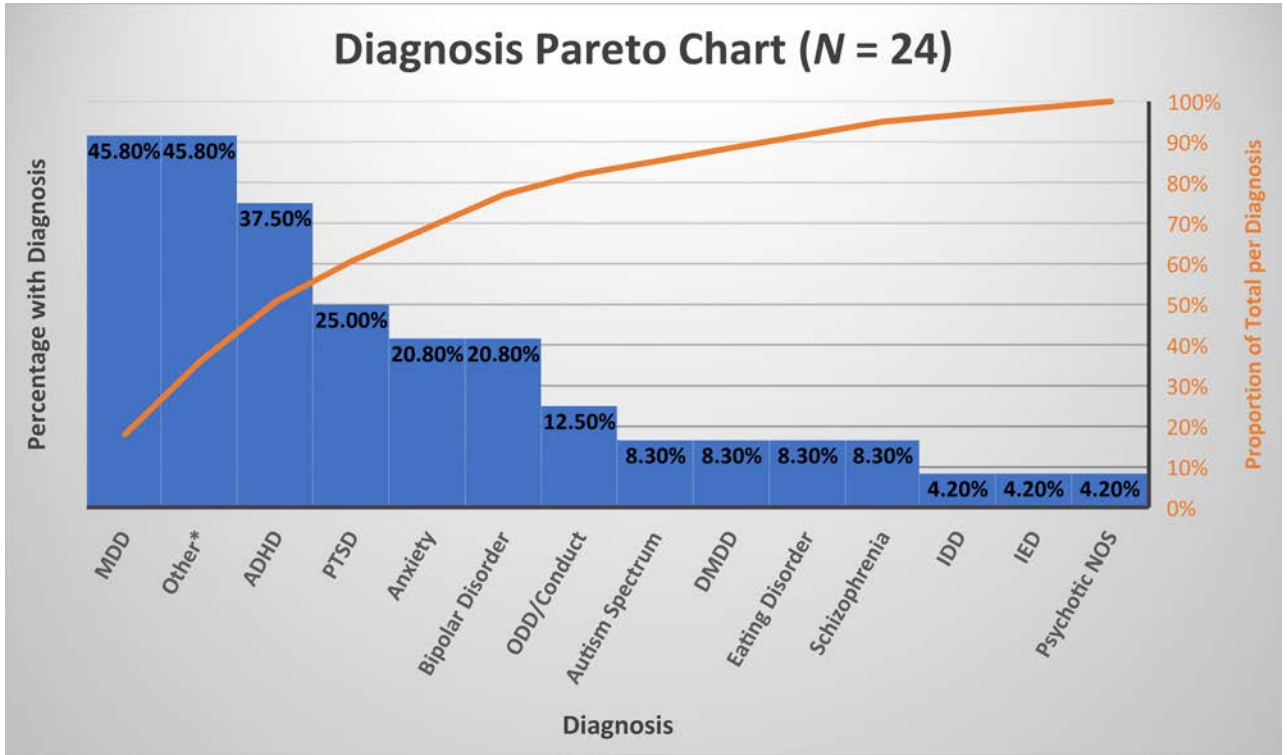


*Note:* Pre-YERE ED visits decreased from 1.96 ( $sd = 1.829$ ) to 1.13 ( $sd = 1.227$ ) post-YERE implementation. The difference between the two means was not statistically significant at the .05 level ( $t = 1.964$ ,  $df = 23$ ). Pre-YERE inpatient psychiatric admissions slightly decreased from 1 ( $sd = 1.180$ ) to 0.88 ( $sd = 0.947$ ) post-YERE implementation. The difference between the two means was also not statistically significant at the .05 level ( $t = 0.421$ ,  $df = 23$ ). Pre-YERE combined ED and inpatient psychiatric admission decreased from 2.96 ( $sd = 2.579$ ) to 2 ( $sd = 2.064$ ) post-YERE implementation. The difference between the two means was not statistically significant at the .05 level ( $t = 1.457$ ,  $df = 23$ ).

Appendix C

Figure 2

*Most Common Diagnoses Among Youth*

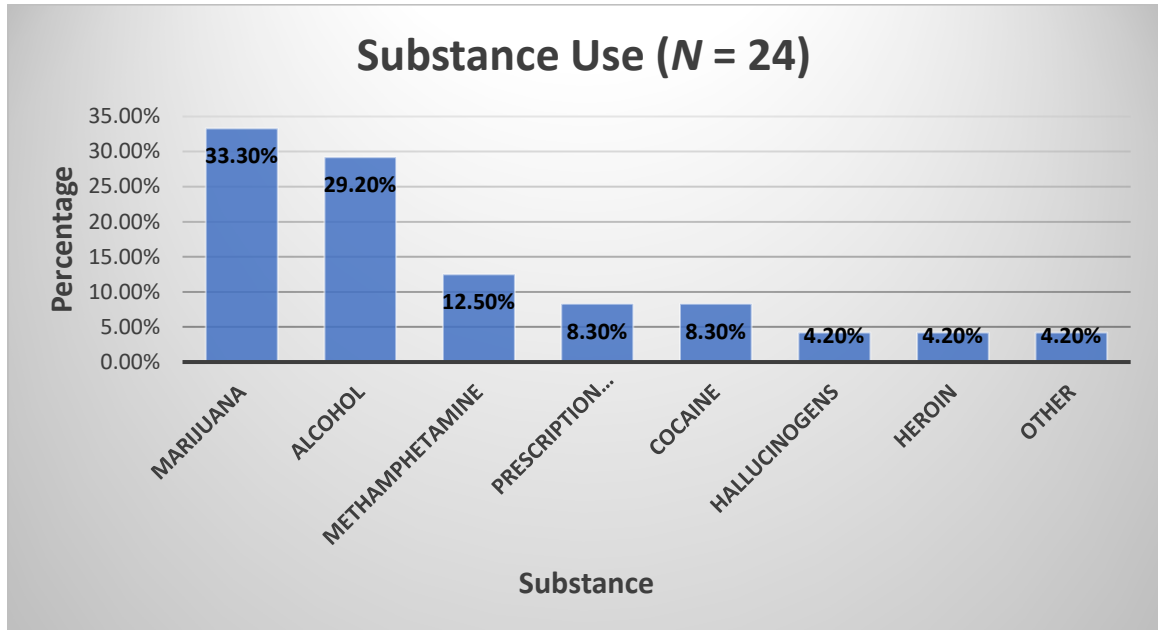


\*Other = unconfirmed mental health diagnosis

Appendix D

Figure 3

*Percent of Youth with Documented Substance Use*



## Appendix E

Table 3

*Multiple Regression Analysis of Demographic Variables*

| <i>Summary of Multiple Regression Analysis (N = 24)</i>  |          |                       |          |                 |
|--|----------|-----------------------|----------|-----------------|
| Variable   | <i>B</i> | <i>SE<sub>B</sub></i> | <i>B</i> | <i>p</i> (Sig.) |
| Intercept (Constant)   | -1.500   | 1.962                 | --       | .457            |
| Zip Code   | .319     | .043                  | .886     | .000            |
| Age  | -.001    | .085                  | -.002    | .987            |
| Number of Days in Program  | .010     | .009                  | .154     | .283            |
| Gender   | -.430    | .396                  | -.120    | .296            |
| Race   | -.151    | .363                  | -.059    | .685            |
| Number of Mental Health Diagnoses  | -.106    | .226                  | -.060    | .647            |
| Housing Status   | -.191    | .186                  | -.140    | .321            |
| Insurance Status   | .230     | .267                  | .104     | .404            |
| Number of Substances Used  | -.240    | .205                  | -.169    | .262            |
| <b>Note.</b> * $p < .05$ ; <i>B</i> = unstandardized regression coefficient; <i>SE<sub>B</sub></i> = Standard error of the coefficient; $\beta$ = standardized coefficient |          |                       |          |                 |