Evaluating the Utility and Impact

of the

Addiction Comprehensive Health Enhancement Support System

(ACHESS)

on

Youth in Intensive Outpatient Treatment at New Directions, Inc.

An Evaluation Report for:
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Executive Summary

New Directions, Inc., contracted with the Begun Center for Violence Prevention, Research and Education (Begun Center) in the Jack, Joseph and Morton Mandel School of Applied Social Sciences at Case Western Reserve University (CWRU) to evaluate the utility and impact of the Addiction Comprehensive Health Enhancement Support System (ACHESS) on youth undergoing intensive outpatient (IOP) treatment. ACHESS is a combined client-facing mobile phone application ("app") and web-based clinician dashboard used to support and monitor clients seeking addiction treatment. Between May 2016 and April 2017, New Directions provided the Begun Center evaluation team with de-identified demographic and treatment-related data on 28 IOP clients enrolled in ACHESS ("study group") and 28 patients treated the prior year whom were not enrolled in ACHESS ("comparison group"). In June 2017 the evaluation team also conducted a focus group with 7 New Directions staff to acquire information of their experiences, perceptions, and opinions of ACHESS. Analysis of these data demonstrates that a larger percentage of study group clients (54.2%) completed treatment compared to those in the comparison group (42.9%). Additional findings highlight that—on the one hand—several elements of the ACHESS system were successfully integrated into the IOP model of care and appeared to prove useful in positively impacting treatment by way of fostering client-therapist relationships and providing more rapid means to de-escalate client agitation and aggression, as well as by decreasing the total number of days in treatment by nearly one-half. On the other hand—the staff explained that many elements of ACHESS offered neither much utility nor meaningful impact and could be greatly improved. Because this evaluation is based on a very small, purposive sample future research is necessary to test and build-on these findings to further develop the utility and improve the impact of ACHESS for youth in addiction treatment.

The ACHESS App

ACHESS is a client-facing mobile phone and web-based clinician dashboard system that offers ongoing monitoring and support to youth and adults recovering from addictions to alcohol and/or other drugs. Primary challenges of these types of addictions is the propensity for relapse coupled with traditional support systems that often are very expensive, geographically dispersed, operated on limited schedules and lacking in tailored peer support (Gustafson et al., 2013). The ACHESS system holds promise in successfully building on post-hospitalization care because of its portability and immediate *anytime/anywhere* access to emotional, relational and instrumental supportive interventions at a fraction of the cost of more traditional supports (Johnson, Isham, Shah, and Gustafson, 2011). The ACHESS mobile client app offers a variety of services (Chih et al., 2014; McTavish, Chih, Shah, and Gustafson, 2012) that, among others, include:

- a "Weekly Survey" monitoring users' affect, lifestyle balance and substance use;
- a "Beacon" or emergency alert button alerting users' support personnel to any increasing cravings or challenging situations;
- A "Connect" portal allowing users to share thoughts anonymously with peers or connect with personal treatment counselors;
- a "Discover" portal through which users can search the latest addiction-related articles and other "credible" Internet-based resources.

Treatment providers typically use the ACHESS system with clients discharged from residential inpatient treatment to support IOP or after care recovery (Substance Abuse and Mental Health Service Administration, 2017). The app's design is grounded in the three basic tenets of Self-

determination Theory to promote users' adaptive functioning through greater self-perceived competence, social relatedness (feeling connected to others) and motivation (feeling internally motivated and not coerced in one's actions). Strengthening a user's experience in these areas can in turn strengthen coping skills that assist one in both avoiding relapse and increasing quality of life (Marlatt and George, 1984; Ryan and Deci, 2000; McTavish et al., 2012; Gustafson et al., 2013).

Methodology

Participants

Study Group Participants. Those clients comprising the study group were recruited between May 27, 2016, and April 6, 2017, at New Directions, Inc., in Pepper Pike, Ohio. Inclusion criteria were female and male youth under the age of 18 years of age, who were receiving alcohol and drug treatment in New Directions IOP setting. Forty-seven youth initially agreed to use the ACHESS mobile app (Version 2.6.5.3). Thirty-seven of these youth and their parents/guardians provided informed assent/consent to participate in the research. Of these 37 youth, 9 did not follow through with installing the ACHESS app. In the end the study group was comprised of 28 clients—9 females and 19 males—who provided informed assent/consent and installed the ACHESS app.

Focus Group Participants. New Direction staff focus-group participants were invited to participate in this study during the first week of June 2017. Inclusion criteria were female and male staff 18 years of age and older who were involved with the implementation of ACHESS at New Directions. Seven staff members—5 females and 2 males—were invited to participate and

all seven provided informed consent. On June 5, 2017, the evaluation team conducted a focus group interview at New Directions. The evaluation team was comprised of David Hussey, Ph.D., LISW-S, an Associate Professor at the Mandel School of Applied Social Sciences and the Associate Director of Research at the Begun Center, as well as Karen Coen Flynn, Ph.D., Research Associate, and Michael Gearhart, Ph.D., Research Assistant, both also of the Begun Center. The focus group interview was facilitated by Hussey, while Flynn and Gearhart took detailed notes of the discussion. The focus group members self-identified their roles as "therapist" (2), "Assistant Director of Outpatient Services," "Director of Outpatient Services," "Information Technology," "Development Director," and "Chief Executive Officer." Six of the participants were in the meeting room with the evaluation team, and one participated via conference call. After a brief period of introduction, the focus group interview lasted 60 minutes and explored a wide-range of topics centered around the utility and impact of ACHESS.

Procedures

The Begun Center conducted this evaluation based on three types of data:

1. de-identified quantitative data on ACHESS study group participants;
2. de-identified, retrospective quantitative data on a comparison groups of non-ACHESS users whom received IOP services at New Directions in the year prior to implementation of ACHESS; and
3. qualitative data from the New Directions staff focus group interview.

1. ACHESS Study Group Participants. At the time of intake to the IOP setting, New Directions staff discussed with youth and their parents/guardians the opportunity to participate in this study. Once obtaining informed assent/consent, New Directions assigned the youth a Study ID to use in the place of any identifiers during the study data-collection process. The data collected by New Directions staff include demographics (e.g., age, race, gender, family status, housing and employment), mental health diagnoses and psychiatric history, substance use diagnoses, history of substance use, trauma history and legal history. Variables like substance use (e.g., abstinence at discharge), prior victimization (physical, sexual, emotional) and prior juvenile justice involvement (probation, diversion, detentions) were collected on an ongoing basis by the New Directions staff. At the completion of data collection New Directions staff forwarded this study group's de-identified data to the Begun Center evaluators.

2. Retrospective Data Collection for the Comparison Group. Using existing archival data on individual youth whom received IOP services without ACHESS from New Directions in the year prior to the study period, New Direction staff were able to extract information to compare to the types of data that were collected from the ACHESS study group participants. New Direction staff forwarded this comparison group's de-identified data to the Begun Center evaluators.

3. New Directions Staff Focus Group. Evaluation team members conducted a focus group with New Directions staff on June 5, 2017. Among others, questions included: How has the use of the ACHESS app changed your existing IOP model of care? How would you describe the utility of ACHESS? What aspects of the app contributed to its effectiveness in treatment? What were the

greatest challenges to using ACHESS? What feedback did you get from clients about ACHESS? How do you think ACHESS works differently for youth as opposed to adults?

Data Analysis

Analysis of the study/comparison groups data and the focus group data was conducted in the following ways:

1. Group Comparison. The first step of the analysis was constructing a comparison group using propensity score matching (PSM) (Rosenbaum and Rubin, 1983). PSM is the most popular method of constructing a comparison group in non-randomized studies (Pearl, 2010). In this study the evaluation team employed PSM to estimate the probability of treatment assignment using baseline characteristics. This process facilitated the creation a comparison group that was similar to the youth in the study group. Comparisons between the study group and comparison group were conducted using a Pearson's Chi-Squared procedure and T-test. All analyses were conducted using IBM SPSS version 24.

2. Focus Group. The focus group provided an opportunity to explore "rich points" (Agar, 1980), or descriptions of experiences, perceptions, and opinions of the ACHESS app implementation that were offered in New Directions staff members' own words and were outside the evaluators' knowledge. The qualitative focus-group data, in the form of the evaluation team's notes taken during the focus group, were entered into a Word file. This resulting focus group text was analyzed using systematic text condensation (STC) developed by Malterud, based on Giorgi's phenomenological analysis (Malterud, 2012; Giorgi, 1985). The focus group's responses were analyzed through the following structured process. One of the evaluators gained a general

impression of the data by reading the responses and highlighting preliminary themes. The document was then read by the same evaluator a second time with the goal of identifying specific units of meaning relating to the core topics of this ACHESS study. The contents of these meaning units were condensed and sorted to more accurately cover distinct topics. Finally, the meaning units were removed from the broader context of the focus group discussion into consistent statements about staff members' experiences, perceptions and opinions of the ACHESS app's utility and impact. All three evaluators discussed the findings and the two that did not do the STC cross-checked interpretation. The findings of this analysis are illustrated with direct quotes of the focus group participants.

Ethics

This research was approved by Case Western Reserve University's Institutional Review Board for the Protection of Human Subjects.

Findings

Group Comparisons

Table 1 (see p. 8) displays the results of the comparisons between the study group (n = 28) and comparison group (n = 28). The results suggest that the propensity score matching worked well because there are no statistically significant differences between groups in terms of age, race or gender. The average age of participants is between 16 and 17 years old, nearly two-thirds of participants in both groups are White and male. The groups also are similar in terms of family income with roughly one-third of families reporting an annual income between $35,000 to $64,999. The majority of the participants are from Cuyahoga County. A slightly larger

proportion of youth in the comparison group have been in juvenile detention (39.2%, n = 11) compared to the study group (35.7%, n = 10). However, more youth in the study group have been placed in a diversion program (28.6%, n = 8 for the study group; 7.4%, n = 2 for the comparison group).

Table 1 – Sample Comparison Table

	Study Group (n = 28)	**Comparison Group** (n = 28)
Demographics		
Age	16.9	16.4
Male	17 (60.7%)	18 (64.5%)
Race		
African American	11 (39.7%)	8 (21.4)
White	16 (57.1%)	19 (67.9%)
Other	1 (3.6%)	3 (10.7%)
Family Income		
$0-$14,999	6 (21.4%)	5 (17.8%)
$15,000-$34,999	4 (14.3%)	3 (10.7%)
$35,000-$64,999	10 (35.7%)	9 (32.1%)
$65,000-$99,999	8 (21.4%)	5 (17.8%)
$100,000+	2 (7.1%)	5 (17.8%)
Cuyahoga County	20 (67.9%)	21 (75.0%)
Juvenile Justice Involvement		
Any Involvement	17 (60.7%)	16 (57.1%)
Home Detention	9 (32.1%)	9 (32.1%)
Detention	10 (35.7%)	11 (39.2%)
Diversion Program	8 (28.6%)	2 (7.4%)
Substance Use		
Age of First Use	12.9*	14.0*
First Use Before 13	11 (39.3%)*	3 (11.1%)*
Cannabis Diagnosis	25 (89.3%)	23 (82.1%)
Alcohol Diagnosis	4 (14.3%)*	23 (82.1%)*
Other Drug Diagnosis	15 (53.6%)	10 (35.7%)
Multiple Substance Diagnoses	28 (100.0%)	

Mental Health		
Depression	15 (53.6%)	16 (57.1%)
Anxiety/Adjustment Disorder	10 (35.7%)	12 (42.9%)
PTSD	4 (14.3%)	0 (0.0%)
ODD/Conduct	4 (14.3%)	4 (14.3%)
ADHD	7 (25.0%)	10 (35.7%)
History of Self-Harm		
History of Hurting Self	16 (57.1%)	10 (37.0%)
Past Suicide Attempt	14 (50.0%)	9 (33.3%)
Victimization		
Past Victimization	14 (50.0%)	14 (50.0%)
Polyvictimization	9 (32.1%)	6 (22.2%)
Physical	9 (32.1%)	6 (23.1%)
Sexual	3 (10.7%)	2 (7.4%)
Emotional	13 (46.4%)	13 (46.4%)

* $p < 0.05$

Although the groups are similar to one another in terms of substance use, there are some important differences worth noting. On average, the study group started using substances at a younger age (12.9 years) compared to the comparison group (14.0 years). Further, a significantly larger proportion of youth in the study sample used substances before turning 13 (39.3%, n = 11) compared to the comparison group (11.1%, n = 3). Considerably fewer youth in the study group (14.3%, n = 4) have a diagnosis for alcohol use relative to the comparison group (82.1%, n = 23). Over half of the study group (53.6%, n = 15) have a diagnoses for a substance other than alcohol or cannabis. The most common "other" substance use or abuse diagnoses are for opioids (25.0%, n = 7), hallucinogens (21.4%, n = 6), and cocaine (14.3%, n = 4). While the difference between groups in terms of other substance diagnoses are not statistically significant, this finding suggests that youth in the study group are likely to use multiple drugs.

The majority (85.7%, n = 24) of youth in both groups have a diagnosis for a mental health or emotional issue. The most common mental health issue is depression, with roughly half of the youth in both samples having a diagnosis. It also is worth noting that one youth in the study group has a diagnosis for dysthymia—a more chronic form of depression. Anxiety/Adjustment disorder is also prevalent with 10 (35.7%) and 12 (42.9%) of youth in the study and comparison groups having a diagnosis. Only four youth (14.3%) have a PTSD diagnosis, and all of these youth are in the study group. Four youth (14.3%) have an opposition defiant disorder/conduct disorder diagnosis in both groups. ADHD was prevalent in the sample with 7 (25.0%) and 10 (35.7%) youth having a diagnosis in the study and comparison groups, respectively.

Although the differences between groups are not statistically significant, a larger proportion of the study group have a history of hurting themselves (57.1%, n = 16) and past suicide attempts (50.0%, n = 14) compared to the comparison group (37.0%, n = 10 and 33.3%, n = 9, respectively). Half of the youth (n = 14) in both samples experienced some form of victimization. Further, 32.1% (n = 9) of the study sample and 22.2% (n = 6) of the sample experienced more than one type of victimization. Emotional abuse is the most prevalent form of victimization with 13 youth (46.4%) in both samples having been victimized. Roughly 30.0% of both samples also report experiencing physical abuse.

Table 2 (p. 11) displays the outcomes for youth in the study and comparison groups. As noted at the bottom of the table, four participants are currently in treatment, resulting in a sample size of 24 for the study group. Roughly 60% of the youth in the study group (58.3%, n = 14) and comparison group (60.7%, n = 17) were abstinent at discharge. In terms of treatment

completion, a slightly larger proportion of the study group (54.2%, n = 13) completed treatment compared to the comparison group (42.9%, n = 12). This represents a 20.8% increase in terms of the number of youth who completed treatment. There were no statistically significant differences between groups in the number of days in treatment. However, the number of days in treatment for treatment completers in the comparison group (150.5) is twice the number of days for completers in the study group (69.3). While the number of youth is very small, it may be encouraging that the youth in the study group who left treatment against staff advice stayed in treatment longer than those in the comparison group (107.2 days and 79.0 days, respectively), because this may suggest that the ACHESS app helped retain these youths in treatment longer.

Table 2 – Evaluation Outcomes Table

	Study Group (n = 24[a])	**Comparison Group** (n = 28)
Abstinent at Discharge	14 (58.3%)	17 (60.7%)
Reason for Discharge		
Complete	13 (54.2%)	12 (42.9%)
ASA/Admin	5 (17.9%)	8 (28.5%)
Transfer	5 (17.9%)	8 (28.6%)
Days in Treatment		
Total	76.8	108.1
Complete	69.3	150.5
ASA/Admin	107.2	79.0
Transfer	71.8	81.0

* $p < 0.05$

[a] n = 24 because 4 participants are still in treatment.

Focus Group

The focus group interview began with the facilitator asking, “Has use of ACHESS changed the IOP model of care?” In their responses the participants explained that they had successfully integrated some elements of ACHESS into the care model, but they emphasized that this process took time. “Yeah, OK, I have to do this even when we already have so much to do,” is how one

participant described staff members' early attitude toward implementing ACHESS. One participant explained that this attitude had changed and that ACHESS is now "more 'a part of' as opposed to 'an add on'" to the IOP model of care.

The discussion then turned to examining the utility and impact of specific elements of the ACHESS system. The participants emphasized two elements of the client-facing mobile app that were the most useful: the text messaging tool and the Beacon emergency alert button. As one participant noted,

> Some aspects [of ACHESS] are very useful, [such as] the messaging portion where [clients] can message a counselor directly or message each other for support. We've had a lot of kids use this. They can reach out for help—it can be hard to call—they use the texting service.

Some participants described this text message capability as a "lifeline" for clients that lessened their sense of isolation at night and on weekends, in particular, when accessing therapeutic support can be more difficult and time-consuming. One participant explained that,

> Texting is more direct. [During implementation planning] we agonized over some things that we shouldn't have worried about like, Who was going to be on the Beacon? Will third-shift staff answer? Will our staff be motivated? In the end it became a feature that we had very few Beacon calls and more texts.

Some participants offered the perspective that this more immediate line of communication between clients and therapists appeared to have enhanced client treatment and retention. According to one participant, "Before youth were inconsistently showing up to treatment. Now

we can learn from texting them the reason for the absence. This gives us an opportunity to offer motivation for completing treatment." Another participant explained that,

> Even something as minor as a client not being able to make it to treatment that day, the client can let us know. [Texting] reduces anxiety on parents and youth. Less phone tag about why they missed.

Another one observed,

> They'll reach out for a crisis via text and that can expedite their connecting. They're reaching out, which is a positive. From a treatment side [therapists] can pay attention as a group. We're more in the moment. When I see the numbers … for shorter [length of stay], I'm not surprised… because I'm more connected with the client on an ongoing basis. Before, a crisis would happen and treatment would be delayed because we aren't reacting to the crisis in real time.

Participants also noted some texting-related caveats. "For my sanity I've had to set boundaries and say that I won't get back to you at 3:00 a.m.," said one. "Text me, but I won't get back to you [until morning]. As technology increases that will become a thing for a lot of agencies—to figure out the boundaries." Another offered that, "It's not a bad thing that they do wait. Maybe this helps teach them a social skill, to wait until morning."

The focus group went on to discuss the utility and impact of the Beacon button, which appeared to support more rapid de-escalation of client agitation and aggression. Recounted one participant, "[One youth] and the parents were arguing, and [the] parents were going to call the police." The participant continued by explaining that,

The youth already had charges, so if police came the youth would likely have spent the night in jail. [The youth] pushed 'Beacon.' Staff responded with, 'Are you OK?' and the youth explained the problem and then came in for a treatment session. [At the time of the alert] we talked to the parents and they did not call police.

Discussion and Conclusions

There are limitations to this analysis that should be considered. Because this evaluation is based on a small, purposive sample, it is important to use caution in the interpretation of its results. Other questions remain such as, Is the study group of 28 representative of the larger group of 47 who originally agreed to use the ACHESS mobile app? Are there particular factors that make some youth more apt to use a mobile phone app like ACHESS, as opposed to those whom did not?

With these limitations in mind, some of the study findings that follow still may have significant implications for ACHESS utility and impact in IOP addiction treatment settings for youth. What emerged from the findings is that ACHESS appeared to have impacted *IOP treatment completion rates* and *number of days in treatment*. A significantly larger proportion of the clients in the study group (54.2%) completed treatment than those in the historical comparison group (42.9%), and days in treatment decreased to 76.8 days for the study group clients down from 108.1 for those in the comparison group. These results appear even more promising when compared to the Substance Abuse and Mental Health Services Administration (SAMHSA) Treatment Episode Data Set (TEDS) national data reflecting 203,127 IOP treatment discharges in 2012 for individuals aged 12 years and older. SAMSHA reports that 67,411 (33.2%) individuals completed IOP treatment and the median length of stay was 84 days (2015, pp. 21-22).

Additionally, the findings underscore that number of days in treatment may not be the best way to measure retention, especially if youth in the study group are getting more emotional, relational

and instrumental support out of their treatment because of the app, and may be advancing more quickly in treatment.

Other findings supporting the impact of ACHESS emerge from the group comparison on closer examination of the study group's client characteristics. The study group had more youth whom started alcohol and other drug use before 13 years of age, had a diagnosis of other drug use, had hurt themselves or attempted suicide in the past and had PTSD. These characteristics suggest that the study group youth may have been more challenging to care for than the comparison group if they were using substances that were harder to treat and had suffered more trauma (Tiet, Ilgen and Byrnes, et al., 2007). These findings also are promising in light of the research demonstrating that the first year of implementation of most evidence-based practices and programs produce more modest outcomes than subsequent ones (Fixsen, Naoom, Blase, and Friedman, 2005).

Additional findings bring to light the processual achievements of the New Directions staff. The ACHESS implementation initially involved training the staff in the mobile app and clinical dashboard, and then subsequently involved their ongoing on-boarding and monitoring of individual clients. Throughout the introduction and implementation of ACHESS, New Directions IT staff also provided ongoing technical support. While the therapeutic staff eventually melded key elements of ACHESS with their existing IOP model of care to create a new one, it is important to recognize that the implementation process added additional burdens to already complex and fast-paced clinical and administrative workflows.

The findings also demonstrate that the ACHESS text messaging tool was viewed by staff as providing great utility in facilitating communication between clients and therapists, as well as appearing to directly impact the depth of client-therapist relational aspects of treatment. The focus group discussion also underscored that clients are more likely to text when they need support, but it is necessary to establish client-to-therapist texting boundaries. The Beacon button, too, proved very useful in alerting staff to difficult situations, and had the most impact in assisting clients seeking support in rapidly escalating, potentially threatening social and relapse situations. In spite of these examples of utility and impact, the findings also underscore wide-ranging difficulties with the app, especially in regard to the Beacon button, the survey/text messaging/medication/meeting tools, and overall user experience. In the end, future research is necessary to test and build-on these findings to further develop the utility and improve the impact of ACHESS for youth in addiction treatment.

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