

Impact of a Culturally Relevant Residential Treatment Program on Post-Discharge Outcomes for Hawai`i Youth

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Abstract

Drug abuse among adolescents, particularly among Native Hawaiian youth, is a serious concern on the Hawaiian Islands. Native Hawaiians possess the highest incidence of drug abuse and lowest success rates with traditional treatment programs. Some evidence suggests that culturally relevant treatment programs can be more effective for this population, but such evidence is limited. This study looked at the behavioral impact of a drug treatment program in Hawai`i using a culturally relevant model. Youth who were clinically discharged from the Marimed Foundation's Kailana Model for Residential Treatment were compared to those youth who were non-clinically discharged. With no significant pre-treatment differences between the two groups, results of a follow-up 12-months post-discharge found significant improvement in arrest rates, number of days until re-arrest, and number of total arrests. While these are only the results for one specific culturally relevant treatment program, it does offer the foundation for further investigation into this type of treatment model.

Impact of a Culturally Relevant Treatment Program

Long-term, untreated drug abuse for adolescents has been associated with a host of adverse physical, mental, and social consequences including greater involvement with the juvenile justice system, increased mental health problems, lower educational achievement, and increased risk of adult substance abuse patterns (Chatterji, 1998; D'Amico, Edelen, Miles, & Morral, 2008). According to the Substance Abuse and Mental Health Services Administration (2009), the average percentage of adolescents ages 12 to 17 who regularly use illicit drugs is 9.3%. This percentage is slightly misleading when one considers the rate steadily increases from 3.3% in youth ages 12 to 13 up to 21.5% at age 18. In addition, the earlier the age of onset of drug abuse and the longer history of this use are highly correlated to adult substance abuse and mental health concerns (SAMHSA, 2009).

Recent studies have shown Native Hawaiian youth make up the majority of adolescents requiring substance abuse treatment in the State of Hawai'i, possess the highest substance abuse rates in the state, and record the least effective results of treatment outcomes with traditional treatment approaches (Nishimura, Goebert, Ramisetty-Mikler, & Caetano, 2005; Nishimura, Hishinuma, Else, Goebert, & Andrade, 2005). From 2000 to 2006, the number of juveniles entering substance abuse treatment facilities in the State of Hawai'i increased by 41.1%. Of those juveniles entering treatment, the majority (52%) were Native Hawaiian and Pacific Islander (Nahar, et al., 2008).

The most frequently abused illicit drug by juveniles in Hawai'i is marijuana, with methamphetamines being the most abused substance by adults age 18 to 49 (Nahar et al., 2008). This trend toward increasing drug severity with age is particularly disturbing because treatment programs for methamphetamine users tend to possess much less favorable treatment outcomes than other substances (Rawson, Gonzales, Obert, McCann, & Brethen, 2005). Instances such as this illustrate why it is critical to address substance abuse issues as early as possible.

These research findings, combined with both state and national trends in drug abuse as well as the overwhelming health consequences of untreated substance abuse, underscore the critical need for increased knowledge about the types of substance abuse treatment that work best

for Native Hawai'i youth. While many studies have been done on both adult and adolescent residential treatment programs (Godley, Godley, Dennis, Funk, & Passetti, 2002; Morral, McCaffrey, & Ridgeway, 2004; Williams, 2000), very few have focused on programs targeting this specific population.

Several researchers have emphasized the need for culturally sensitive and culturally relevant treatment when working with at-risk, minority populations, particularly youth (Carter, Straits, & Hall, 2007; Paz, 2002; Perez-Arce, Carr, & Sorensen, 1993; Tharp, 1991). Although the term "culturally relevant" has frequently appeared in the literature, particularly in regards to substance abuse treatment programs, the term has not been adequately defined or operationalized. For the purpose of this article, "culturally relevant treatment" refers to a treatment approach utilizing activities, experiences, ways of viewing the world and interacting with others, and norms that are infused with the unique values (e.g. historical, social) of the local community (Dumas, Rollock, Prinz, Hops, & Blechman, 1999). The few studies focusing on drug abuse treatment for Native Hawaiians and Pacific Islanders have found cultural sensitivity to be a critical piece in program effectiveness (Kim & Jackson, 2009; Morelli, Fong, & Oliveira, 2001).

Morelli et al (2001) explored the impact of a culturally relevant treatment milieu when working with pregnant and post-partum women. Women involved in the program were interviewed about their treatment. A consistent theme regarding to their continued participation was the importance of cultural competent practitioners and cultural healing practices. Since this study only looked at an adult female population, there are limitations to the generalizability of the study to youth. In addition, it did not provide information about long-term outcomes for the women.

One evaluation study looking at outcomes specifically for Hawai'i youth in a culturally relevant treatment program was conducted by Kim and Jackson (2009) using the Global Appraisal of Individual Needs (G.A.I.N) instrument. Testing with the G.A.I.N., which is a nationally normed survey validated through use with over 12,000 individuals (LighthouseInstitute, 2002), was done at in-take and then at 3-, 6-, and 12-months post-intake for youth involved in the Marimed Foundation's Kailana Model of Community Based Residential Treatment. The researchers found statistically significant

differences from intake to 3-, 6-, and 12- months for a number of constructs, including self-reported legal involvement, drug abuse, and mental health problems. This study showed the promise of this culturally relevant model for working with Hawai'i youth, but the lack of a control group limited the degree to which the positive changes could be attributed to the treatment. Similarly, the self-report G.A.I.N. did not provide information about concrete behavioral changes for youth completing the program.

Based on these limitations, the present study was designed to evaluate the impact of the Marimed Foundation's Kailana Model on concrete behavioral outcomes for youth who successfully complete the program as compared to those that did not. It is often difficult to measure concrete behavioral change in terms of drug use and abuse without physically testing for substance use. A recent report by the Substance Abuse and Mental Health Services Administration (2005) found that criminal activity and substance abuse are associated with each other and tend to have co-occurring patterns making it possible to use changes in criminal involvement as a surrogate marker to measure changes in substance abuse patterns. Therefore, through the use of a comparison group and by accounting for several covariates, the present study showed the direct link between successful completion of a culturally relevant treatment and positive post-treatment behavioral outcomes, including re-arrest status and time to re-arrest.

Methods

Program

The Kailana (English translation: "calm seas") Community Based Residential Treatment Program is a highly-structured, staff-secure, residential program for high risk Hawai'i adolescents needing comprehensive treatment and education, including mental health services. Kailana, combines individual, group, and family therapy with educational and vocational services, as well as ocean and land-based therapeutic and recreational activities including sailing and ocean voyaging on Makani Olu (Marimed's sail training vessel), canoe paddling, agriculture, and aquaculture. Kailana is unique in its ocean-based, experiential approach to serve youth with moderate to severe emotional and behavioral problems. In particular, the program serves males ages 14 through 18 requiring an experience more

structured and restrictive than school or home-based services, but not needing hospitalization or incarceration. The program specializes in adolescent males with conduct disorders and dual diagnosis with chemical dependency.

The program incorporates the core values of CHART (Community, Honesty, Aloha, Respect and Teamwork) and is designed to value the historical and cultural aspects of the Hawai'i and Pacific Island people. With this value in mind, the model integrates traditional and modern uses and stewardship of natural resources (ocean and land) as key elements in the healing process. The significant impact of the program is the relationship between what is done in treatment, where it is done, and how it is done. For example, when service learning projects are done in a culturally relevant way and experientially loaded with metaphor and meaning making – they are more profound and therefore therapeutic to the youth.

Subjects

Subjects included in this study were all the youth treated through the use of the Marimed Foundation's Kailana Model of Community Based Residential Treatment during the period from March 2003 through August 2007. Of the 198 youth receiving treatment during that timeframe, only those under the age of 18 at the end of one year of follow-up were included in this study (n=139). This decision was made to insure the records being used to assess behavioral outcomes were complete and could be accessed through the State's juvenile record system without any of the youth being lost to the adult system. The State of Hawai'i maintains a database of information on all juveniles involved in the justice system that is updated every 30 minutes and includes information from the police departments, courts, and parole and probation officers across the state. It was through a data-sharing agreement with this Juvenile Justice Information Committee that data on all youth were compiled.

The youth in the study were classified as either "Clinically Discharged" (n=47) or "Non-clinically Discharged" (n=92). When youth first enter the program, they meet with their new Clinical Treatment Team and a Treatment Plan is designed for the course of their time at Kailana. A youth is classified as 'Clinically Discharged' when he meets 85% of his treatment plan goals. Because the program is not conducted at a locked facility, there are instances when the youth

leave for a variety of reasons. While in many cases the youth return after a few days and complete their treatment, there are other cases where they never meet their treatment plan goals. When this occurs, these youth are then classified as “non-clinically discharged.”

Measures

A list of all Marimed youth involved in treatment for the specified timeframe was generated. This dataset included discharge status, the number of days spent in treatment, age at intake, and age at discharge. This list was then presented to the Juvenile Justice Information Committee to use for data extraction. This Committee collected information on: (a) ethnicity, (b) age of first arrest, (c) total number of arrests prior to treatment, (d) most serious offense prior to treatment, (e) whether the youth was re-arrested in the 12 months following discharge, (f) the total number of arrests following discharge where applicable, and (g) the most serious offense committed following discharge where applicable. The most serious offense for each youth was then classified as a violent crime, a sex crime, a property crime, a minor offense, or a status offense.

Analysis

Many of the variables collected were used to insure the groups were adequately matched prior to examining the 12-month follow-up data. An independent samples t-test was used to compare clinically and non-clinically discharged youth to determine if there were pre-existing differences between the groups for age at first contact with the law, age at intake, age at discharge, number of days spent in treatment, and number of arrests prior to treatment. In addition, Chi-square analyses were conducted to determine if there were differences in ethnicity between the two groups and if there were differences in the types of offenses being committed by the two groups.

A Chi-square analysis was conducted on re-arrest data at 12-months following discharge for both sets of youth. An ANCOVA was then used to compare if there were differences in the number of days between discharge and re-arrest, with number of days spent in treatment serving as the covariate. A Kaplan-Meier survival function curve was also used to estimate and graph true differences in the probability of re-arrest based on discharge status. The outcome of the survival function was considered to be the time spent in the community

until either re-arrest or end of the 12-month follow-up period.

Results

Pre-Treatment Demographics

Table 1. Comparison of Baseline characteristics: Clinically (n=47) and Non-Clinically (n=92) Discharged youth

	Clinical	Non-Clinical	Statistic
Age			
Intake	15.60	15.62	t=-.201
Discharge	16.24	15.88	t=2.886**
Day in Program	231.1	90.6	t=9.268***
Ethnicity			$\chi^2=5.120$
Hawaiian/Pac Islander	63.0%	71.7%	
Caucasian	17.4%	12.0%	
Black	6.5%	1.1%	
Asian	4.3%	8.7%	
Other	8.7%	6.5%	
Arrest Information			
Age First Contact	12.49	12.52	t=-.092
# Pre-Treatment Arrests	11.0	11.65	t=-.410

*p<.05

**p<.01

*** p<.001

Table 1 presents the baseline characteristics for clinically and non-clinically discharged youth for age at intake, age at discharge, days spent in treatment, ethnicity, number of arrests before treatment, and age at first contact with the law. There were no significant differences between youth who were clinically discharged and youth who were non-clinically discharged in terms of age at intake, age of first contact with the law, and total number of arrests prior to intake. In addition, there were no significant differences in the ethnic breakdown of the two groups.

Table 2 highlights information about the most serious offenses for the clinically and non-clinically discharged youth. The overall Chi-square was not significant, $\chi^2 (5, N=129) = 3.031, p = .695$, indicating there were no significant differences in the types of offenses.

Table 2. Most serious offense prior to treatment for Clinically versus Non-Clinically discharged youth

	Clinical	Non-Clinical	Total
Violent Crime	41.5%	31.8%	34.9%
Sex Crime	2.4%	9.1%	7.0%
Property Crime	41.5%	39.8%	40.3%
Drug/Alcohol Crime	7.3%	11.4%	10.1%
Minor Offense	2.4%	2.3%	2.3%
Status Offense	4.9%	5.7%	5.4%

$\chi^2=3.031$

$p=.695$

Note there were significant differences in the average number of days spent in treatment when the clinically discharged group was compared to the non-clinically discharged group ($t=9.268$, $p<.001$). These differences in the days spent in treatment accounts for the significant differences noted in age at discharge for the two groups ($t=2.886$, $p=.005$).

12-Month Follow-Up Outcomes

Youth who were clinically discharged from the Marimed Foundation’s Kailana Model for Community Based Residential Treatment experienced significantly lower rates of re-arrest than those youth who were non-clinically discharged. There also were significant differences in the number of days until re-arrest for the clinically discharged youth compared to the non-clinically discharged youth. This difference was maintained even when the amount of time spent in treatment was included as a covariate.

There were significant differences in the total number of juvenile arrests following discharge for those youth who were clinically discharged (4.2 arrests) compared to non-clinically discharged (6.8) ($t=-2.630$, $p=.01$). Given there were significant differences in the age at discharge for these two groups (see Table 1) one could argue this difference could potentially be accounted for by the fact that youth who were clinically discharged had less time at-risk of re-arrest out in the community and therefore would have fewer arrests. Thus, it was important to compare these two groups across a consistent time-frame. Therefore, all subsequent results were based on a 12-month follow-up for each youth.

Statistically significant differences in re-arrest were found between the clinically discharged and non-clinically discharged youth

at 12-months ($\chi^2(1, N=139) = 16.46, p < .001$) (See Table 3). Using standardized residuals as a method of post hoc analysis for Chi-square tests revealed positive differences for not being re-arrested for clinically discharged youth (Standardized Residual = 2.9) and negative differences for non-clinically discharged youth (Standardized Residual = -2.1). All of the residuals greater than 1.96 or less than -1.96 were considered statistically significant at the alpha level of .05 or less. This indicated clinically discharged youth were re-arrested less than would be expected, and non-clinically discharged youth were re-arrested more than would be expected. A Cohen's d effect size of $d = .733$ was calculated using the Effect Size Determination Program (Wilson, 2001). This is a medium to large effect size (McMillan, Lawson, Lewis, & Snyder, 2002).

Table 3. Behavioral outcomes for youth who were clinically discharged as compared to non-clinically discharged following 1-year follow-up

		Clinical	Non-Clinical	Statistic
Within 12-months				$\chi^2 = 16.46^{***}$
Rearrested	n	28	82	
	%	59%	89%	
Not Rearrested	n	19	10	
	%	41%	11%	
Days to Re-arrest		234	81	$t = 4.042^{***}$
Days to Re-arrest -adjusted for days in program		258	70	
Number of Total Arrests		4.1	6.7	$t = -2.63^*$

* $p < .05$

** $p < .010$

*** $p < .001$

In addition to significant differences in re-arrest rates between clinically and non-clinically discharged groups, there were significant differences in the amount of time between discharge until re-arrest ($t = 4.042, p < .001$). Table 3 shows those youth who were clinically discharged were re-arrested almost four times later than those youth who were non-clinically discharged (234 days compared to 81 days). That represents a mean difference of 153 days with a 95% Confidence Interval [76.8, 230.0]. Effect sizes was computed using the Effect Size Determination Program (Wilson, 2001). Cohen's d calculated for the number of days to re-arrest based on discharge status was $d = .81$, which is considered a large effect (McMillan, et al., 2002).

As seen in Table 1, there were significant differences in the number of days spent in treatment for the clinically discharged youth compared to non-clinically discharged youth. Given earlier research has shown that the number of days spent in treatment can impact outcomes regardless of discharge status (De Leon, 1973), it was necessary to assess the number of days after discharge before re-arrest controlling for this covariate. The resulting ANCOVA showed when the number of days spent in treatment were controlled for, there was still a significant impact of the youth's discharge status on the number of days spent without re-arrest ($F(1,116)=24.324, p<.001, \text{partial } \eta^2=.173$). This means the youths' discharge status accounted for 17.3% of the difference in the number of days between discharge and re-arrest. The adjusted means for number of days elapsed without re-arrest when controlling for days spent in treatment, was 258 days for clinically discharged youth and 70 days for non-clinically discharged youth. Calculations of effect size using the Effect Size Determination Program (Wilson, 2001) produced Cohen's $d=.984$, which is associated with a large effect size (McMillan, et al., 2002).

Table 4 displays the case summary, means, and standard error for the Kaplan-Meier survival function curve used to estimate the differences in the probability of re-arrest based on discharge status. Risk of re-arrest as determined by the survival function is significantly different based on discharge status (log rank $\chi^2=2.06, df=1, p<.001$). The graph of the survival function is shown in Figure 1.

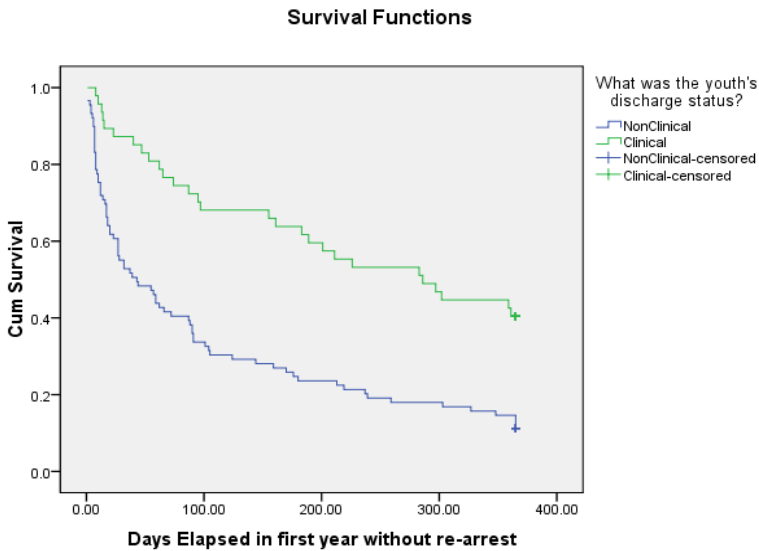
Table 4. Means and Standard Error for Survival Time

Discharge Status	Total N	n of events	Censored	
			N	Percent
Clinical	47	28	19	40.4%
Non-Clinical	89	79	10	11.2%
Overall	136	107	29	21.3%

Discharge Status	Estimate	Std. Error	95%Confidence Interval	
			Lower Bound	Upper Bound
Mean*				
Clinical	230.9	20.5	190.7	271.1
Non-Clinical	110.5	13.9	83.2	137.8
Overall	152.1	12.6	127.5	176.7

*Estimation is limited to the largest survival time if it is censored

Figure 1. Survival curves for Clinical versus NonClinical Discharges for re-arrest within the first year following discharge.



Discussion

Given the ineffectual outcomes experienced by Native Hawaiian youth in traditional treatment programs, it is important to identify other possible options for effective treatment for this population. Due to the limited number of adolescent drug treatment programs in Hawai'i, let alone culturally relevant drug treatment, few prior studies have examined the impact and effectiveness of culturally relevant treatment programs for working with Native Hawaiian youth. Native Hawaiian or Pacific Islanders represent 65% of the treatment population at the Marimed Foundation. Because of this, Marimed utilizes a culturally relevant treatment model. The results of this study suggest youth who are clinically discharged from the Marimed Foundation's Kailana Model have better outcomes than those youth who are not clinically discharged. As one of the first evaluation studies to look at youth outcomes in a culturally relevant program that includes a matched comparison group, it provides some evidence to the effectiveness of such programs designed specifically for working with Native Hawaiians and Pacific Islanders.

One year follow-up outcomes were compared for youth who

were clinically discharged from the Marimed Foundation's Kailana Model of Community Based Residential Treatment versus youth who were not clinically discharged. Fewer of the clinically discharged youth (59%) were rearrested in the first year following discharge than the non-clinically discharged youth (89%). This means four times as many clinically discharged youth were not rearrested after discharge as compared to non-clinically discharged. While 59% may still seem like a high re-arrest rate, the clinical and practical significance of having 30% fewer youth re-arrested in a year can not be emphasized enough.

In addition, for those youth who were re-arrested, the average number of days elapsing prior to their post-discharge arrest was significantly greater for the clinically discharged youth when compared to the non-clinically discharged youth (i.e., 234 days versus 81 days). In fact, when controlling for the number of days spent in treatment, this difference became even greater at 258 days compared to 70 days. This mean difference of 188 days translates into over six months longer without being involved in the legal system for the clinically discharged youth.

The clinically discharged and non-clinically discharged youth were well matched in this study. There were not significant differences on most pre-treatment demographics, including age at intake, age at first contact with the law, types of crimes committed, and ethnic background. This matching is an important component of the study design because many of these factors have been linked with differential outcomes. For example, age at which youth are first involved with the legal system has been associated with greater subsequent involvement in the legal system (Huizinga & Henry, 2008). Similarly, age at which treatment begins and more violent arrests have also been associated with greater risk (Barrett, Katsiyannis, & Zhang, 2006). Without this type of matching, there would be a great deal of uncertainty about whether any of the observed differences in outcomes were attributable to the treatment rather than to systematic differences between the youth.

There were two differences between the two groups as a result of treatment that should be addressed – the number of days spent in treatment and the age at discharge. The number of days spent in treatment was different for those youth who were clinically discharged. Given that earlier research has suggested a potential

dosage response to treatment (De Leon, 1973) it was possible the differences in treatment outcomes were a function of the number of days spent in treatment as opposed to the clinical discharge diagnosis. To address this, the analysis controlled for the number of days which were spent in treatment and found that there was still a significant impact of the youth's discharge status on the number of days to re-arrest. Thus, even if a youth was in treatment for shorter period of time, if he was clinically discharged, he would, on average, have better outcomes than someone who received more treatment time but was not clinically discharged.

Another difference between the groups was the age at discharge. This is a direct function of the fact that the two groups were the same age at intake but had different lengths of time in treatment. While there is some chance that the differences in outcomes between the two groups could be attributed to the four months difference in age between the two groups, this is unlikely given that the number of days in treatment, which is the cause of the age difference, did not have a significant impact on the outcomes.

There were several limitations to this study that should be noted. Even with the level of matching achieved, there is the possibility that the non-clinically discharged youth differed from the clinically discharged youth in some important and unobserved ways. One potential difference could be the drug of choice for the youth. Some early work has shown that individuals who are addicted to methamphetamines typically have poorer treatment outcomes than those who are addicted to marijuana or alcohol (Rawson, et al., 2005). Therefore, it is possible that those youth that were clinically discharged were all those youth who did not use methamphetamines while those that were non-clinically discharged did. A 2006 study found that less than 5% of the admissions for drug treatment in the State of Hawai'i for youth under 17 years of age were for methamphetamine use (Nahar, et al., 2008). Thus, the likelihood that all 92 non-clinically discharged youth, or 66%, were primarily methamphetamine users is not very likely, but it is possible. Therefore, it is important for further exploration into whether there are differential outcomes for youth who abuse methamphetamines as compared to other illicit drugs when assessing culturally relevant treatment programs.

Another limitation of this study is the comparison group for this study did not consist of untreated youth, but instead were youth who

received varying amounts of Marimed treatment. Therefore, it is not possible to comment on the absolute treatment effect of the Marimed Kailana model, but only on the apparent effect relative to that of the non-clinically discharged group. In order to determine the absolute treatment effect, it would be necessary to compare the clinically discharged youth to a similarly matched group who were placed by the juvenile justice system into the Hawai'i Youth Correctional Facility, which is generally not considered a treatment facility.

Future investigators that are trying to determine the impact of culturally relevant treatment should explore many of the issues that were previously articulated. Is there a differential impact on outcomes based on the type of drug abused? How do youth who do not receive any treatment fare compared to those that receive culturally relevant treatment? In addition, future research should strive to identify the components of the Marimed model, and culturally relevant models in general, that are critical to treatment. Follow-up studies with both the Marimed program and other treatment programs, both those that are culturally relevant and those that are not, should be undertaken in order to further understand the impact of programs on youth in the Hawaiian Islands.

While these results are promising with regard to establishing the positive impacts of culturally relevant drug treatment programs, it is critical to remember these are results for only one program and cannot be generalized to all culturally relevant treatment programs in Hawai'i. Marimed is only one program in a state with limited drug treatment options for youth, particularly Native Hawaiian youth, therefore, it is important to continue to work to identify, develop, and refine effective treatment models for this population.

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