Initial Assessment of a Culturally Tailored Substance Abuse Prevention Program and Applicability of the Risk and Protective Model for Adolescents of Hawai‘i

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Abstract
Background: Cultural interventions to decrease substance abuse must be introduced and evaluated.
Methods: Change in risk and protective factor ratings from a brief cultural school-based program were measured.
Results: Students demonstrated significant improvements in school commitment, self esteem, and perceived harm of drugs. These changes correlated with decreased report of drug use.
Discussion: The Pono curriculum demonstrated effectiveness using the risk and protective factor model.

Introduction
Substance use is one of the most dangerous challenges facing adolescents today. It is associated with suicide, risk of violence, child abuse, unemployment, school truancy, and many medical conditions such as addiction, heart disease, and stroke. When surveyed about illegal drug usage, 51.1% of 12th graders in the United States admit to having used in their lifetime and 4% of students nationwide admit to having used crystal methamphetamine or “ice”. In Hawai‘i, the overall data are similar with 46.9% of 12th graders having used drugs in their lifetimes and 4.2% having used crystal methamphetamine. However, 60% of Native Hawaiian 12th grade students in Hawai‘i report having used an illicit drug and 5.6% have used crystal methamphetamine. This article describes a culturally tailored substance abuse prevention program targeting Native Hawaiian youth and assessment of program effectiveness using the risk and protective factor model.

Many risk and protective factors have been shown to be associated with substance abuse. Risk factors associated with increased substance use include: lack of parental supervision, inappropriate norms about substance use, family conflict, and peer antisocial activities. In addition, substance use has been found to be a function of the number of risk factors present in adolescents’ lives. Protective factors linked to decreased substance use include self esteem, social skills, family bonding and cultural identity. Czuchry and Dansereaau (2000) found that raising self esteem resulted in improved outcomes for substance abuse treatment. Nielson, Scarpitti, and Inciardi (1996) describe the benefits of building self esteem and self concept, social skills, and vocational skills on decreasing substance use. It is well-documented that treatment is more effective when compatible with clients’ cultural patterns. Unger et al (2004) described the process of acculturation and the development of cultural/ethnic identity among adolescents decreasing substance abuse in a diverse community. Belgrave, Reed, Plybon, and Corneille (2004) describe a culturally enhanced drug prevention program for adolescent African American girls after which participants in the intervention group reported being significantly less tempted to use alcohol and drugs and greater drug refusal efficacy than girls in the comparison group. A study by Brook and Pahl (2005) found that multiple aspects of ethnic and racial identity and familism were important protective factors that offset other risk factors and lead to less drug use. School factors, including sense of bonding and commitment, grades, and attendance, have been shown to decrease substance use. The Pono curriculum described below works to increase cultural identity, self esteem, family bonding, social skills, and communication skills.

The Pono Curriculum
In 2001, a group of concerned citizens, recovering substance users, health care workers, and community leaders, headed by Mr. Wayde Lee, on the rural Island of Moloka‘i, developed a culturally tailored and interactive curriculum based on 21 Native Hawaiian spiritual and cultural values that includes communication, cooperation, conflict resolution, honesty, purity, patience, encouragement, generosity, and retribution as represented in Figure 1.
The Pono curriculum stresses living the 21 program principles to increase self confidence, sense of pride about cultural heritage, and understanding of Hawaiian spiritual and cultural principles; teaching communication and conflict resolution skills to improve family and community relationships; and learning the risks of substance use. Using the Hawaiian canoe as a metaphor, the roles and responsibilities of the paddlers were compared to the youth and their relationships in the home, with friends, in school, and with the community in which they live. The ocean symbolizes the vast and dynamic environment with the waves representing emotions that peak and recede as they journey through life. The developer of this curriculum, Mr. Lee, teaches the youth about doing the right thing (being Pono), which means taking care of your family, your friends, your community, your environment, and yourself, as these are all interrelated. For example, poisoning your body with things that are harmful to you (drugs, alcohol, and cigarettes) affects not only the individual but also his or her family, friends, community, and the environment.

The implementation of the Pono Curriculum on the island of Hawai‘i and the evaluation research effort was funded by the U.S. Department of Health and Human Services (DHHS), Substance Abuse and Mental Health Services Administration (SAMHSA), Center for Substance Abuse Prevention (CSAP), under a larger island-wide substance abuse prevention effort called the Pulama Project. The current study examines changes in risk and protective factors that are associated with decreased use of Alcohol, Tobacco, and Other Drugs.
(ATOD), as well as self report of future intent of using ATOD. This serves a dual purpose of (1) assessing the applicability of the risk and protective model in understanding substance abuse among youth of Hawai'i and (2) assessing overall effectiveness of the Pono curriculum program in preventing youth substance abuse.

Methods

Hypothesis
The research hypothesis was that participants would significantly improve their self rating of the following factors after the intervention (from pretest to posttest):

1. School commitment
2. Family relations
3. Self-esteem
4. Problem solving skills
5. Cultural pride
6. Decision making skills
7. Negative attitudes toward drug use

The research design involved a single group, pre-post within-subjects comparison. The program group was tested at baseline and again 8 weeks later after completion of the curriculum to determine percent change. The program achieved a posttest completion rate of 86.6%.

Survey tools
Seven survey tools totaling 72 questions, plus demographic information was collected. Most of the measures were selected from SAMHSA’s recommended standardized core measures and the Government Performance and Results Act (GPRA).22

Instruments

Demographic Information was collected to assess socio-demographic characteristics including gender, age, grade, ethnicity, and household composition and stability.

Student Survey of Risk and Protective Factors/Little Commitment to School (School Commitment) measures school bonding and commitment as it requests the respondents to assess their perception of meaningfulness, interest, and importance as related to their school. Three items ask respondents how many days they missed school due to illness, skipping, or other reasons, and were summed into a Total Number of Days Missed scale for the current analysis. Developed by Arthur, Hawkins, Catalano, and Pollard,24 the overall scale has shown a reliability estimate of 0.76. The School Commitment scale was analyzed using 6 items with scores ranging from 1 to 5, which demonstrated a Cronbach’s alpha score for this sample of 0.76 also.

Family Relations/Cohesion Scale assesses youth perception of family closeness and time spent together. It is a 6-item measure (four-point likert-type scale) developed by Gorman-Smith that has shown a reliability estimate of 0.80 for use with children. Cronbach’s alpha for this sample of youth was 0.75.

Self Esteem Scale is a 10-item scale developed by Rosenberg (1965) that taps respondent’s global feelings of self-worth or self-acceptance. Scores range from 1 to 4 with higher scores indicating greater self-esteem. In previous studies, Cronbach’s Alpha Reliability estimate ranged between .77 and .88, while this sample had Cronbach’s alpha of 0.81.

Problem Solving is an 11-item scale developed by Nolan Zane (Four Winds Research Corporation)25 that assesses the participant’s ability to effectively solve problems and address problem situations. Scores range from 1 to 4 with higher scores indicating greater problem solving ability. In previous studies, Cronbach’s Alpha Reliability estimate ranged between .69 to .82, while this sample had Cronbach’s alpha of 0.68.

Cultural Pride is a 10-item scale also developed by Nolan Zane that assesses the youth’s general feelings and acceptance about his/her culture. Scores range from 1 to 4 with higher scores indicating greater cultural pride. This is one of few existing measures that was normed on a high-risk Asian sample with an internal reliability alpha coefficient of .86. With this sample, this scale had Cronbach’s Alpha Reliability estimate of 0.83.

Decision Making (Resistance to Negative Peer Pressure) is a 10-item Resistance to Negative Peer Pressure Scale (Nolan Zane, Four Winds Research Corporation) that was also normed on high-risk API sample with a .86 internal reliability alpha coefficient. Each item provides youth with a brief description of a social situation and asks them to rate the likelihood that they would respond to the situation in a particular way. The four-point likert-type response set is utilized for this measure. With this sample, this scale had Cronbach’s Alpha Reliability estimate of 0.92.

GPRA instrument contains items assessing Past 30 Day Alcohol, Tobacco, and Other Drug (ATOD) Use (19 items), lifetime alcohol use (single item), age of first ATOD use (4 items), Intent to Use ATOD (reversed and renamed Intent to Not Use ATOD; 4 items), Perceived Harm of ATOD Use (5 items), and Positive Attitudes Toward ATOD Use (reversed and renamed Negative Attitudes Toward ATOD Use; 4 items). Cronbach’s Alpha Reliability estimate for the Past 30 Day ATOD Use scale was 0.87; the Intent to Use ATOD scale was 0.63; the Perceived Harm of ATOD Use was 0.89; and the Negative Attitudes Toward ATOD Use Scale was 0.82.

Subjects
The target population for the project included troubled and at-risk adolescent youth on the island of Hawai’i. Youth meeting at least 3 of the following inclusionary criteria were screened by program staff as potential participants: (1) family income at or below poverty level, (2) multiple children residing in single headed household, (3) history of family or peer substance or alcohol abuse, (4) one or more parent unemployed, (5) family members have past or current legal involvement, (6) lack of supervised positive alternative activities for the youth, (7) poor family housing condition, including crowded living space, or (8) youth who have begun experimenting using substances and are at risk of becoming active or chronic substance
were allowed to choose more than one category. Other races/ethnicities included 27.6% White, 24.9% Filipino, 24.0% Portuguese, 21.2% Chinese, 19.8% Japanese, 7.8% Indian/Alaskan Native, 7.4% Samoan, 5.1% Korean, 3.7% Hispanic, 2.3% Black, 2.3% Other Asian, 6.9% Other Pacific Islander, and 14.7% ‘Other.’ About 30% said that a language other than English (primarily Hawaiian and Filipino dialects) is spoken in their home most of the time. When asked how many times they moved in the last 12 months, 65.9% reported never moving. Others reported moving once (17.5%), twice (6.0%), three times (2.8%), four times (1.4%), six times (1.4%), seven times (0.5%), and nine times (0.5%), while 4.1% of the participants did not respond. When asked how many people live in their home, 51.6% reported one to five people, 39.2% reported six to ten people, 5.1% reported 11 to 15 people, and 2.8% reported more than 16 people. Over three-fourths (78.3%) of the youth reported living with their mothers and 65.9% with their fathers, while 71.0% reported living with brothers and/or sisters, 23.0% with their grandparents, 15.7% with other adult relatives or guardian, 0.5% each live alone, with roommates, or with a spouse/significant other, and 7.8% reported ‘Other.’

**Informed consent**

Consent was obtained in writing from the parents of all participants, and verbally and in writing from the students involved in the study. All informed consent procedures were conducted in English or in their native language at the time of the initial registration into the project by a trained staff and/or research assistant.

**Procedures**

All research and project staff had extensive knowledge and experience in working with youth of Hawai‘i and their cultures and were trained regarding: (1) legal and ethical data collection procedures and guidelines, (2) using care and sensitivity when collecting data from youth subjects, (3) providing proper and consistent instruction to subjects, (4) minimizing missing data, (5) assuring confidentiality and anonymity to each subject so that their response would be as honest and accurate as possible, and (6) using culturally appropriate communication and approaches in data collection for the target population. The research team worked closely with the project staff to streamline the data collection, data entry, and data storage process.

The data entry system was developed by the evaluation team that includes a detailed codebook and data entry computer file utilizing the Statistical Package for Social Sciences (SPSS) software package version 11.5 software. All Pono surveys were administered in a scannable version format. An administrative assistant trained in the scanning software program, and not involved in direct data collection, reviewed the data file and randomly checked for accuracy against the hard copies of the questionnaires. Additional reviews of the quality of data entry included examining frequency statistics on all variables to ensure that the codes entered were consistent with the codebook and as instructed as well as to examine any extreme outliers.

**Analysis**

Multiple analysis of variance for repeated measures procedures were performed on the pre and post surveys from the 155 youth who provided complete data for all items at both pretest and posttest. A 0.05 level of significance was used with multivariate (Hotelling’s T) and univariate (F-ratios) significance testing. Similar analyses were also used to explore gender differences across variables. Correlational analyses were conducted to examine the relationships between the variables in the risk and protective factor model for this target population. Statistical analyses were completed using the SPSS.

**Results**

Statistically significant increases were found in the total sample after intervention in the areas of: Self-Esteem (p < 0.042), Perceived Harm of ATOD Use (p < 0.040) and School Commitment (p < 0.007). An unexpected statistically significant increase was also revealed for Total Number of (School) Days Missed (p < 0.003). Problem Solving, Cultural Pride, Decision Making, Family Bonding, Intention to Not Use in the Future, and Negative Attitudes Toward ATOD Use demonstrated trends toward improvement, although they did not reach significance. Furthermore, while not statistically significant, the mean scores for Past 30-Day ATOD Use remained low: on a scale of 1 to 7, the mean score at pretest was 1.06 and the mean score at posttest was 1.05. Likewise, the mean scores for Illicit Drug Use showed a non-significant decrease from 0.25 to 0.14.

Analyses of gender differences revealed that girls had increased Self-Esteem (p < 0.015) and Problem Solving (p < 0.044), and decreased Intention to Not Use ATOD (p < 0.049) after the intervention. Boys only showed a significant increase in School Commitment (p < 0.045). However, both gender groups reported unexpected significant increases in Total Number of (School) Days Missed (for girls: p < 0.033; for boys: p < 0.050).

Results of correlational analyses found significant relationships between ATOD use and almost all of the risk and protective factors assessed in this study. Past 30 Day ATOD Use was significantly negatively correlated with School Commitment (r = -0.247, p < 0.001), Family Relations (r = -0.433, p < 0.000), Self-Esteem (r = -0.254, p < 0.000), Cultural Pride (r = -0.187, p < 0.011), Problem Solving (r = -0.189, p < 0.009), Decision Making (r = -0.343, p < 0.000), Intention to Not Use ATOD (r = -0.485, p < 0.000), and Negative Attitudes Toward ATOD Use (r = -0.385, p < 0.000). A significant positive correlation was shown between Total Number of Days Missed and 30 Day ATOD Use (r = 0.311, p < 0.000). Numerous other statistically significant relationships among the risk and protective factors are also shown in Table 2.
Table 1.— Total Sample Pre-Post Results

<table>
<thead>
<tr>
<th>Measure</th>
<th>Pretest</th>
<th>Posttest</th>
<th>F</th>
<th>df</th>
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<td></td>
<td>0.27</td>
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<td>School Commitment (0-3)</td>
<td>2.82</td>
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<td>Number of Days Missed (0-18)</td>
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<td>2.80</td>
<td>2.79</td>
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<td>8.89</td>
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<td>Family Domain</td>
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<tr>
<td>Family Bonding (1-4)</td>
<td>3.33</td>
<td>0.47</td>
<td>3.30</td>
<td>0.51</td>
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<td>Self Esteem (1-4)</td>
<td>2.96</td>
<td>0.53</td>
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<td>0.54</td>
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<td>2.96</td>
<td>0.40</td>
<td>3.01</td>
<td>0.40</td>
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<td>Cultural Pride (1-4)</td>
<td>3.31</td>
<td>0.48</td>
<td>3.36</td>
<td>0.45</td>
<td>1.78</td>
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<td>Decision Making (1-4)</td>
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<td>3.34</td>
<td>0.63</td>
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<td>ATOD Domain</td>
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<td>Perceived Harm of ATOD Use (0-3)</td>
<td>2.18</td>
<td>0.76</td>
<td>2.32</td>
<td>0.74</td>
<td>4.30</td>
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<td>Negative Attitudes Toward ATOD (0-3)</td>
<td>2.57</td>
<td>0.62</td>
<td>2.66</td>
<td>0.58</td>
<td>3.12</td>
<td>0.08</td>
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<td>Intention to Not Use in the Future (0-2)</td>
<td>1.72</td>
<td>0.42</td>
<td>1.68</td>
<td>0.42</td>
<td>1.95</td>
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<td>Illicit Drug Use (0-14)</td>
<td>0.25</td>
<td>1.31</td>
<td>0.14</td>
<td>0.60</td>
<td>0.91</td>
<td>0.34</td>
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<tr>
<td>Past 30-Day ATOD Use (1-7)</td>
<td>1.06</td>
<td>0.24</td>
<td>1.05</td>
<td>0.11</td>
<td>0.31</td>
<td>0.58</td>
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n = 155

Discussion

In a sample of 155 students, the 8-week Pono curriculum for substance abuse prevention was found to be effective at significantly increasing protective factors of school commitment, self esteem, and perceived harm of ATOD use. In girls, it also increased self report of problem solving ability and intention to not use ATOD. Youth who reported less ATOD use were more likely to also report greater school commitment, family relations, self-esteem, cultural pride, problem solving skills, decision making skills, intent to not use ATOD, and negative attitudes toward ATOD, as well as fewer school absences. In addition, most of these risk and protective variables showed significant correlations with each other. These results are consistent with findings from previous research efforts exploring risk and protective factors and substance use. Because the results of correlational analyses revealed expected relationships between risk and protective factors and ATOD use, the authors infer decreased rates of drug use in the future in this group of students. Furthermore, the fact that overall ATOD and illicit drug use were low at pretest and remained at a low level at posttest, suggest a positive preventive effect of the program.

Positive trends in mean scores were also revealed for other scales, although they were not statistically significant. These include problem solving, cultural pride, decision making, and negative attitudes toward ATOD use. A factor to consider, however, is that most of the scales demonstrated relatively high mean scores at pretest, making it difficult to achieve further improvements. The significant increase in reported school absences was an unexpected finding. School officials and project staff have indicated that increase in absences as the school year progresses is a common phenomenon in these schools.

Table 2.— Correlations Between Self Rating Variables

| 1) School Commitment | 1.000 |
| 2) Family Relations  | 0.441*** | 1.000 |
| 3) Self-Esteem       | 0.267*** | 0.430*** | 1.000 |
| 4) Cultural Pride    | 0.419*** | 0.485*** | 0.268*** | 1.000 |
| 5) Problem Solving   | 0.391*** | 0.479*** | 0.428*** | 0.367*** | 1.000 |
| 6) Decision Making   | 0.444*** | 0.278*** | 0.282*** | 0.219** | 0.315*** | 1.000 |
| 7) Intention to Not Use ATOD | 0.382*** | 0.309*** | 0.284*** | 0.138 | 0.211** | 0.530*** | 1.000 |
| 8) Perceived Harm of ATOD | 0.115 | -0.005 | 0.168* | 0.082 | 0.050 | 0.238** | 0.289*** | 1.000 |
| 9) Neg. Attitudes Toward ATOD | 0.419*** | 0.354*** | 0.219** | 0.198** | 0.300*** | 0.512*** | 0.557*** | 0.126 | 1.000 |
| 10) Tot. Number of Days Missed | -0.200** | -0.296*** | -0.255*** | -0.013 | -0.150* | -0.187* | -0.395*** | -0.096 | -0.312*** | 1.000 |
| 11) 30 Day ATOD Use   | -0.247** | -0.433*** | -0.254*** | -0.187* | -0.189** | -0.343*** | -0.485*** | -0.060 | -0.385*** | 0.311*** |

*p < 0.05, **p < 0.01, ***p < 0.001
Study limitations include the lack of a comparison or control group, and thus the researchers could not rule out other potential causes of changes. Second, larger program effects may not have been detected, since posttests were administered after only 8 weeks. A longer period of study, including follow-up assessments, would be required to adequately assess changes in these youth on a longer-term basis. Third, while gender appeared to be a factor in outcomes, larger sample sizes would be needed to determine the program’s differential effect on boys and girls. Fourth, although the expected correlations among risk and protective factors and ATOD use were found, it is not clear whether changes in risk and protective factors are causally linked to ATOD use in these students. Further research must be conducted to substantiate the findings presented in this study.

In summary, while many considerations must be taken into account when interpreting these results, they offer an initial step toward assessing substance abuse prevention programs for youth of Hawai‘i. The findings suggest that the risk and protective model, along with the measures used in this study, may be usefully applied in prevention research and practice with this population. Furthermore, this data suggests that the Pono Curriculum is a potentially efficacious culturally-based program for youth of Hawai‘i and merits further study.

References