CRITICALLY APPRAISED PAPER (CAP)

FOCUSED QUESTION
What is the evidence that technology-based prevention interventions are an effective means of reducing substance use in adolescents?


CLINICAL BOTTOM LINE:

Substance use prevention and intervention for Asian-Americans is an important accessibility and equity issue, given that Asian-Americans are an underrepresented population in understanding substance use due to facing multiple barriers in accessing quality programs. This study evaluated the effectiveness of a web-based prevention program aimed at the relationship between mother and daughter in decreasing substance use and strengthening family relationships.

This Level I randomized controlled trial assessed 11 areas: mother–daughter closeness; mother–daughter communication; maternal monitoring; parental rules; depression; body esteem; self-efficacy; refusal skills; peer use normative beliefs; substance use intention; and 30-day substance use in the areas of alcohol, cigarettes, marijuana, and prescription drugs. The web-based prevention programs allowed the participants to have flexibility and control during the intervention by navigating through the topics at their own pace. In addition, using a web-based prevention program enabled users to overcome geographical limitations in accessing the intervention. This type of prevention program may be more suitable for Asian-American adolescents and their parents, who might be uncomfortable with disclosing information within a group setting.

The study indicated that the web-based intervention improved mother–daughter relationships when compared to the control group. The strong relationship correlated with a decrease in substance use and increased self-efficacy.

Occupational therapists can play a role in assisting in prevention programs. The ability to target adolescents through the web allows for further availability of occupational therapist outreach. Occupational therapists may explore ways to incorporate components of this intervention that may enhance ethnic identification and strengthen ethnic pride among adolescent Asian-American girls.
The findings of the study should be interpreted cautiously. The intervention program was only available in English, restricting non-English speaking Asian-American daughters and mothers. There was a monetary compensation for participant completion of the nine modules. Some of the participants had to be reminded to complete modules while others did not. The online intervention was self-report, creating potential biases. The sample size was small and fathers were not involved in the study, so the results could not be generalized to other populations. The outcome measures’ validity was not reported; further, the measures were apparently adapted from established measures, which may have violated the psychometric properties.

**RESEARCH OBJECTIVE(S)**

List study objectives.

Provide a 2-year outcome data on a prevention program that focused on family-based web delivery for substance abuse for Asian American girls. The program is based on the family interaction theory that depends on three domains: adolescent personality (depression, low self-esteem, control of emotions); familial factors, including parent–child relations (parent–child bond and communication, family rules); and peer influence. The researchers hypothesized that substance use among Asian-American girls may be prevented by increasing parental support and strengthening parent–child relationships. They also hypothesized that the program would intervene on individual, family, and peer level risk and protective factors for Asian-American girls and reduce substance use behaviors.

**DESIGN TYPE AND LEVEL OF EVIDENCE:**

Level I: Randomized controlled trial, pretest/posttest

Limitations (appropriateness of study design):

Was the study design type appropriate for the knowledge level about this topic? *Circle yes or no, and if no, explain.*

<table>
<thead>
<tr>
<th>YES/NO</th>
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**SAMPLE SELECTION**

How were subjects selected to participate? Please describe.

Participants were recruited from 19 states via postings on social networks sites and advertising through social service agencies in the United States; 30.6% of the participants were in the West, 28.7% in the South, 26.8% in the Northeast, and 13.9% in the Midwest. The participants were recruited from consultations with community agency staff members and focus groups with Asian-American youth. All participant girls were between the ages of 10 and 14, with a mean age of 13.10 for girls and 39.73 for mothers.

**Inclusion Criteria**

Both girls and mother needed to commit to participation and having private access to a personal computer.
Exclusion Criteria

NR

SAMPLE CHARACTERISTICS

$N = 108$

<table>
<thead>
<tr>
<th>% Dropouts</th>
<th>15 (13.9%)</th>
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<tbody>
<tr>
<td>#/ (%) Male</td>
<td>0</td>
</tr>
<tr>
<td>#/ (%) Female</td>
<td>93</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Asian-American</td>
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<tr>
<td>Disease/disability diagnosis</td>
<td>Substance use</td>
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Check appropriate group:

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
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<tbody>
<tr>
<td>&lt; 20/study group</td>
<td>20–50/study group</td>
</tr>
<tr>
<td>51–100/study group</td>
<td>101–149/study group</td>
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</table>

INTERVENTION(S) AND CONTROL GROUPS

Add groups if necessary

Group 1: Intervention Group

Brief Description | Each participant dyad who consented to the study received a consent and assent package by mail. They received a unique study identification and password and completed a baseline survey on the web. The intervention group completed 9 module sessions on the web and participants were encouraged to complete one intervention session each week to apply the learned content and skills and receive feedback from their social environments. The modules incorporated developmentally tailored audio, animation, graphics, and activities and engaged mothers and daughters through skill demonstration, guided rehearsal, and immediate feedback. They also received one annual booster session between the two follow-up measurements. The annual booster session reviewed the initial program material and highlighted issues on self-efficacy, problem solving, refusal skills, parent monitoring, parent–child communication, and parent–child closeness.

The intervention group was closely monitored. The participants were not allowed to log on to the next module until they completed the previous one, and they were not able to answer the web-based follow-up measures until they completed all modules and the booster session. During the second follow-up assessment, mothers and daughters were asked specific questions about the intervention activity.

Setting | The participant’s home
Who Delivered? | Computer-based program
Frequency? | 35–45 minute sessions 1x per week with 3–5 interactive modules for girls
and mothers to complete together. One annual booster after 1 year.

| Duration? | Baseline, 1 and 2-year follow-up |

**Group 2: Control Group**

| Brief Description | Each participant dyad who consented to the study received a consent and assent package by mail. They received a unique study identification and password and completed a baseline survey on the web. The survey looked at 11 areas: mother–daughter closeness; mother–daughter communication; maternal monitoring; parental rules; depression; body esteem; self-efficacy; refusal skills; peer use normative beliefs; substance use intention; and 30-day substance use in the areas of alcohol, cigarettes, marijuana, and prescription drugs. The control group did not receive the 9 modules but was required to take the assessment at the 1- and 2-year follow-up. |
| Setting | No intervention |
| Who Delivered? | No intervention |
| Frequency? | No intervention |
| Duration? | Baseline, 1- and 2-year follow-up |

**Intervention Biases:** *Circle yes or no and explain, if needed.*

- **Contamination**
  - YES/NO

- **Co-intervention**
  - YES/NO

- **Timing**
  - YES/NO The study was conducted over a 2-year time frame, allowing for growth in the parent–child relationship. During follow-up sessions, the mothers and daughters in the intervention dyad were asked specific questions related to the intervention activity. No questions were asked of the control dyads.

- **Site**
  - YES/NO The intervention took place in the home, so may indicate potential biases.

- **Use of different therapists to provide intervention**
  - YES/NO

**MEASURES AND OUTCOMES**

Complete for each relevant measure when answering the evidence-based question:

Name of measure, what outcome was measured, whether the measure is reliable and valid (as reported in article – yes/no/NR [not reported]), and how frequently the measure was used.
Mother–daughter closeness was adapted from the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987) and measured mother–daughter closeness by answering five questions that ranged in score from 1–5. The Cronbach alpha reliability score is 0.91. Validity was NR.

<table>
<thead>
<tr>
<th>Name of measure, what outcome was measured, whether the measure is reliable and valid (as reported in article – yes/no/NR [not reported]), and how frequently the measure was used.</th>
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<tbody>
<tr>
<td>Mother–daughter communication was adapted from the Family Problem Solving Communication Index (McCubbin, Thompson, &amp; McCubbin, 1996), which measured mother–daughter communication by answering five questions that ranged in score from 1–5. The Cronbach alpha reliability score is 0.83. Validity was NR.</td>
</tr>
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</table>

Maternal monitoring was adapted from the Parenting Practices Questionnaire (Gorman-Smith et al., 1996), which measured maternal monitoring by answering five questions that ranged in score from 1–5. The Cronbach alpha reliability score is 0.89. Validity was NR.

Family rules about substance use was adapted from the Strengthening Families Program (Spoth, Redmond, & Shin, 1998), which measured family rules about substance used by answering three questions that ranged in score from 1–5. The Cronbach alpha reliability score is 0.82. Validity was NR.

Depressive symptoms were adapted from the Children’s Depression Inventory (CDI; Kovacs, 1992), which measured depressive symptoms by answering 10 questions that ranged in score from 0–2. The Cronbach alpha reliability score is 0.81. Validity was NR.

Body esteem was adapted from the Self-Perception Profile for Adolescents (Harter, 1988) and measured body esteem by answering five questions that ranged in score from 1–5. The Cronbach alpha reliability score is 0.85. Validity was NR.

Self-efficacy was adapted from the Self-Efficacy Scale (DiClemente, Prochaska, & Gibertini, 1985), which measured self-efficacy by answering five questions that ranged in score from 1–5. The Cronbach alpha reliability score is 0.89. Validity was NR.
Refusal skills was adapted from the Drug Refusal Skills (Macaulay, Griffin, & Botvin, 2002), which measured refusal skills by answering ten questions that ranged in score from 1–5. The Cronbach alpha reliability score is 0.84. Validity was NR.

Peer substance use normative beliefs was adapted from the Monitoring the Future national survey (Johnston, O’Malley, & Bachman, 2011), which measured peer substance use normative beliefs by answering six questions that ranged in score from 0–4. The Cronbach alpha reliability score is 0.82. Validity was NR.

Substance use intention was adapted from the Commitment to Not Use Drugs Scale (Hansen, 1996), which measured substance use intention by answering eight questions that ranged in score from 1–5. The Cronbach alpha reliability score is 0.88. Validity was NR.

Thirty-day substance use was adapted from the American Drug and Alcohol Survey (ADAS; Beauvais, Edwards, & Oetting, 2003), which measured 30-day substance use that focused on four items. Reliability and validity was NR.

Measurement Biases
Were the evaluators blind to treatment status? Circle yes or no, and if no, explain.

YES/NO

Recall or memory bias. Circle yes or no, and if yes, explain.

YES/NO The modules used self-report which may be difficult to determine accurate results.

RESULTS
List results of outcomes relevant to answering the focused question
Include statistical significance where appropriate ($p < 0.05$)
Include effect size if reported

As hypothesized, mother–daughter dyads who received the intervention had stronger parent–child closeness ($p < .0002$) and better parent–child communication ($p = .019$) at the 2-year follow-up than the control group. Mothers in the intervention group exerted more parental monitoring ($p = .019$) and parental rules ($p = .011$) than the control group. Girls who received the intervention showed stronger self-efficacy ($p = .016$) in avoiding using substances in tempting situations. They had a greater ability to refuse substances ($p = .006$) and a stronger commitment to not using alcohol, cigarettes, and other drugs ($p = .012$). The intervention group
girls abstained longer from alcohol misuse ($p = .038$), marijuana misuse ($p = .043$), and prescription drug misuse ($p = .047$) 2 years after receiving the program. There were not significant effects on cigarette use over time ($p = .171$).

Overall, strengthening the mother–daughter relationships through the web-based prevention program resulted in a decrease in substance use and increased self-efficacy, therefore supporting the hypothesis.

Was this study adequately powered (large enough to show a difference)? Circle yes or no, and if no, explain.

**YES/NO** Although 93 participants is a small sample size, it was adequately powered to show differences.

Were appropriate analytic methods used? Circle yes or no, and if no, explain.

**YES/NO**

Were statistics appropriately reported (in written or table format)? Circle yes or no, and if no, explain.

**YES/NO**

**CONCLUSIONS**

State the authors’ conclusions that are applicable to answering the evidence-based question.

The study demonstrated the sustained efficacy of a parent–child web-based program in lowering risk factors for Asian-American girls’ substance use, enhancing their individual skills and familial protective factors and reducing substance uptake.

Having a strong parent–child relationship can improve communication and closeness within a family, which can assist in preventing substance use. Working on necessary skills like self-efficacy in avoiding substances in tempting situations leads to a greater ability to refuse offers to use substances and a stronger commitment to not use substances in the future. A strong family bond can render strength for Asian-American girls who struggle with issues of self-esteem and conflicting expectations due to their ethnic background. The mothers learned ways to develop clear family rules about consequences of substance use, manage parent–child conflict, monitor their daughters’ behavior and activities, and improve their daughters’ self-image and self-esteem. The intervention environment allowed mothers and daughters to interactively practice social skills and life skills.

Future research should look to identifying components of enhanced ethnic identification.

**References**


This work is based on the evidence-based literature review completed by Taber Pink, OTS, and Carmela Battaglia, PhD, OTR/L, Faculty Advisor, Keuka College.


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