Does perceived risk of harm mediate the effects of a primary care alcohol screening and brief advice intervention for adolescents?

Amy L. Flynn, MS, John R. Knight, Jr., MD, Lon Sherritt, MPH, Sion Kim Harris, PhD
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CeASAR/NEPSAR Study Coordinators and Research Assistants:
Julie Johnson\textsuperscript{1}, Joy Gabrielli\textsuperscript{1}, Nohelani Lawrence\textsuperscript{1}, Melissa Rappo\textsuperscript{1}, Erin Gibson\textsuperscript{1}, Jessica Hunt\textsuperscript{1}, Ariel Berk\textsuperscript{7}, Stephanie Jackson\textsuperscript{5,6}, Amy Danielson\textsuperscript{9}, Jessica Randi\textsuperscript{5,6}, Michael Krauthamer\textsuperscript{9}

INSTITUTIONS:
\textsuperscript{1}Center for Adolescent Substance Abuse Research, \textsuperscript{2}Division of Developmental Medicine, \textsuperscript{3}Division of Adolescent/Young Adult Medicine, Children's Hospital Boston, Boston, MA; \textsuperscript{4}Cambridge Health Alliance, Cambridge, MA; Teen Health Center, Cambridge Rindge and Latin High School, Cambridge, MA, Teen Health Center, Somerville High School, Somerville, MA; \textsuperscript{5}Concord Family Practice, Concord, NH; \textsuperscript{6}Dartmouth-Hitchcock Pediatrics, Concord, NH; \textsuperscript{7}Dept. Pediatrics, Fallon Clinic, Worcester, MA; \textsuperscript{8}Tufts Medical Center - Floating Hospital for Children, Boston, MA; \textsuperscript{9}University of Vermont College of Medicine, Vermont Child Health Improvement Project, Burlington, VT, Milton Family Practice, Milton, VT; Colchester Family Practice, Colchester, VT
Conflict of interest statement:

- I have no commercial relationships to disclose
- I will not be discussing any unapproved uses of pharmaceuticals or devices
- My views do not necessarily reflect those of any of these bodies, or my academic institution
Alcohol remains the most frequently misused substance among youth, and a major contributor to leading causes of their death (unintentional injury, suicide, homicide)

In 2016, 46.3% of 12th graders reported having been drunk (Monitoring the Future survey)

Screening and brief interventions (SBI) in primary care offices show promising effects for youth.

Computer-facilitated screening and clinician brief advice (cSBA) associated with significantly lower youth alcohol use rates, compared to usual care, at 3-month follow-up (Harris et al., Pediatrics, 2012).

A hypothesized mechanism of cSBA’s effect is increased perceived risk of harm (PRoH) of substance use – hypothesis needed testing.
Study Aim

- Examine whether perceived risk of harm was a mediator of the effect of cSBA on adolescent alcohol use

- Hypotheses:
  - cSBA would lead to an increase in PRoH
  - Increased PRoH would lower likelihood of using alcohol
Mediation effect likely moderated by baseline history of prior alcohol use, and the type of risk examined:

→ “Trying alcohol” may seem risky to those with no prior use, but not to those already using

→ “Binge drinking every weekend” may still seem risky to those with prior use
Study Design (2005-2009)
Before/After Comparative Effectiveness Trial

9 primary care sites in New England; 12-18 year-olds arriving for routine visits

1

Recruit/assess cSBA

1-hr Clinician training; Computer system initiated at all sites

Clinicians instructed to “Do what you usually do.”

Treatment as Usual

18

Recruit/assess Treatment as Usual

36
Computer-facilitated system included:

- Computer self-administered CRAFFT screen; immediate feedback about score and risk-level
- 10 interactive pages of science and true-life stories about health risks of substance use
- Clinician brief advice guided by screen results and ‘talking points’ for 2-3 minute discussion with teen
Drugs and alcohol affect your brain and can damage it for life.

Drugs and alcohol can affect memory, coordination, decision making, learning, and cause depression.

Roll over the text below and see what happens to the picture.

<table>
<thead>
<tr>
<th>Area of Brain</th>
<th>Drug Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prefrontal Cortex</td>
<td>Leads to trouble making wise decisions.</td>
</tr>
<tr>
<td>Basal Ganglia</td>
<td>Impairs coordination, slows reflexes.</td>
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<tr>
<td>Hippocampus</td>
<td>Causes short-term memory loss.</td>
</tr>
<tr>
<td>Cerebellum</td>
<td>Affects balance and coordination.</td>
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<tr>
<td>Motor Cortex</td>
<td>Increases risk of stroke among young alcohol drinkers and drug users.</td>
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</table>

Alcohol can hurt your liver.

Drinking can scar your liver, and this can begin during the teen years.

- More than 2 million Americans suffer from alcohol-related liver disease.
- Some drinkers develop alcoholic hepatitis, or inflammation of the liver.
  - This can result in fever, jaundice (abnormal yellowing of the skin, eyeballs, and urine), abdominal pain, death.
- About 10 to 20 percent of heavy drinkers develop alcoholic cirrhosis, or scarring of the liver.
  - This can cause death, even if drinking stops.

[See alcohol-damaged liver](#)

Data Collection and Measures

- Baseline and 3-months follow-up
- PRoH questions from Monitoring the Future:
  - “How much do you think people risk harming themselves (physically or in other ways) if they…”
  - Try 1 or 2 drinks of an alcoholic beverage (beer, wine, or liquor)?
  - Have 5 or more drinks once or twice each weekend?
  - Responses: no risk, slight risk, moderate risk, great risk
Measures cont’d.

- Modified Timeline Follow-Back (TLFB) interview: past 90-day alcohol use days and number of drinks per day
- Demographics, substance use history, other risk factors (use by peers, siblings, parents)
Data Analysis

- Simple and moderated mediation analyses using PROCESS macro (Hayes, 2013) in SPSS v. 23
- Stratified by baseline past-12-month alcohol use
  - No use: PRoH of trying alcohol
  - Prior use: PRoH of HED every weekend
- Outcome: any past-3-month alcohol use at 3 months
- Models controlled for clinic site, demographics, use by peers, family members
Mediator Variables

- Created PRoH trajectory variables (baseline to 3-months) for “trying any alcohol” and “HED every weekend”
- Response options at each timepoint collapsed into:
  - “High” PRoH (“Moderate” or “Great” risk)
  - “Low” PRoH (“No” or “Low” risk)
- 3 Trajectory groups: (3) Stayed high, (2) Increased from low to high, (1) Decreased from high to low, (1) Stayed low
Baseline Characteristics (N=2096)

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Perceived Risk of Harm (Trying alcohol)

No Use  \( p = 0.007 \)

- TAU: Decreased 48.3, Stayed high 57.6
- cSBA: Decreased, Stayed low, Increased

Prior Use  \( p = 0.12 \)

- TAU: Decreased 28.4, Stayed high 32.0
- cSBA: Decreased, Stayed low, Increased

Harvard Medical School Teaching Hospital
Perceived Risk of Harm (HED every weekend)

No Use

- TAU: Decreased 89.1%
- cSBA: Stayed low 92.1%

Prior Use

- TAU: Decreased 74.2%
- cSBA: Stayed low 84.5%

p-values:

- No Use: p=0.025
- Prior Use: p=0.049
**Mediation Results: No Use – PRoH of Trying Alcohol**

3 months Any alcohol use

PRoH Trying Alcohol

-0.140 (0.026, 0.255)

-0.066 (-0.206, -0.007)

-0.731 (-1.444, -0.017)

-0.773 (-1.481, -0.064)

cSBA

-0.482 (-0.925, -0.038)

Any Alcohol Use at 3-mo. follow-up

Direct effect

Indirect effect

Total effect
Mediation Results: *Prior Use – Risk of HED Every Wknd*

3 months
Any alcohol use

- **cSBA**
  - 0.204 (0.030, 0.378)

- **PRoH HED**
  - -0.096 (-0.245, -0.016)
  - -0.390 (-1.444, 0.034)

- **Any Alcohol Use at 3-mo. follow-up**
  - -0.470 (-0.733, -0.207)
  - -0.474 (-0.890, -0.058)

*Direct effect* → *Indirect effect* → *Total effect*
Summary of Findings

- Perceived risk of harm from alcohol use significantly mediated cSBA’s effect on adolescent alcohol use
  - cSBA $\rightarrow$ HIGHER perceived risk
  - Higher perceived risk $\rightarrow$ LOWER likelihood of alcohol use

- The mediation effect differed by baseline history of alcohol use, as hypothesized
  - Among those without prior use, PRoH partially mediated cSBA effect
  - Among those with prior use, PRoH fully mediated cSBA effect
Study Limitations

- Asynchronous control group – potential historical confounding
- All study sites were in New England; generalizability of findings may be limited
- Self-report
Conclusions

- A brief primary care screening and brief intervention system can influence adolescents’ PRoH from alcohol use, contributing to lower rates of use at short-term follow-up
Mediation Results: Prior Use – Risk of HED

3 months HED

PRoH HED

0.180 (0.008, 0.351)

-0.078 (-0.181, -0.005)

-0.235 (-0.713, 0.218)

-0.335 (-0.788, 0.119)

cSBA

-0.437 (-0.700, -0.174)

Binge Drinking at 3-mo. Follow-up

0.180 (0.008, 0.351)

-0.078 (-0.181, -0.005)

-0.235 (-0.713, 0.218)

-0.335 (-0.788, 0.119)

Direct effect

Indirect effect

Total effect
Mediation Results: *Prior Use – Risk of HED*

Perceived risk of harm of **HED** mediated the effect of the cSBA on past 90-day *HED* at 3-month follow-up among those with *prior use at baseline*. 