Teen Tobacco Use Cession: 2010

Steve Sussman, USC

ssussma@usc.edu
News about quality of studies

• Up through Sussman & Sun (2009)
  – 50% still lack comparison conditions
    • 33% lacked comparison conditions post 2000 (better)
  – 27 of 64 studies (42%) described ethnicity of subject
  – 33% of all teen tobacco use cessation studies published post-2000
Main Focus Today

Sussman & Sun (2009) Meta-Analysis (64 studies)

Also empirical review of pharmacologic adjunct, intensive contingency management, internet-based, telephone-based, mass media, and policy studies
Study Selection

• Searches of PsycINFO, MedINFO, the Google Scholar web engine (using the terms “teen”, “adolescent”, “tobacco use”, “smoking”, “cessation”, “programs”), word of mouth.
• Update search conducted June, 2010

• Included:
  – article or report in English;
  – data contents of a teen smoking cessation effort and quit rates;
  – through-study age range 12 to 19 years old;
  – control condition.

• Excluded:
  – <8 cigarette smokers at baseline (<5 smokers per condition);
  – tobacco related interventions for pregnant females (so both genders as subjects);
  – surveys of practitioners in the field was not selected.
Studies Selected

• A total of 130 studies were located

• Only 64 of these studies were controlled trials.
  – In the updated search, only 1 new controlled trial was located
Main Outcome Measures

- The primary endpoint was %quit-rate (P) - %quit-rate (C).
- Data were entered as intent-to-treat (ITT) quit rates (not compliance sample rates).
- The estimated variance of P, (VP), was calculated as $P(100-P)/n$ per arm ($p*q/n$).
- The estimated variance of difference, (VD), was calculated as the sum of each VP; that is, $VD = VP_{progam} + VP_{control}$.
- The combining weight was $1/VD$ (to get weighted average over the effects for all individual projects).
Preliminary Analysis

• Youngest to oldest age at baseline to last follow-up average of 14 and 19 years.
• Baseline smoking averaged approximately 10 cigarettes per day (cpd).
• The average sample size was a mean of 414 (range 12 to 3800; sd=588).
• An average of 51% of subjects was female.
• We failed to find bias (and no trends) in effect size as a function of:
  – variability in sample size
  – year of publication of study
  – random assignment or not
  – follow-up retention
  – average level of baseline smoking (though various studies do find lower quit rates among heavier smokers; e.g., Sussman, Dent, & Lichtman, 2001)
  – country of study (U.S. or Other)
  – gender
  – ethnicity
  – mean age, age range
  – program reach
  – years data were collected
Overall effect, program vs. control
11.79% vs. 7.53% cessation

• Overall absolute risk reduction effect program advantage of 4.26% across 64 studies
  (57% reduction in continued smoking)
  – 27% increase in number of studies in the pool, overall outcomes higher than previous meta-analysis (2.90% advantage with n=48)
  – Effect size not large (d=.33) but meaningful
Treatment (P-C) Means: Current Analysis Stratified by Follow-up Duration

- Follow-up Duration
- 0-3 month (38) 4.17*
- 4-12 month (29) 4.06*
- > 12 month (8) 6.78*

Note. The information in parentheses indicates the number of studies in the current analysis. There was no decay of treatment effects across most studies; all effects are significant.
“Theories”

1. Social influence-oriented: refusal assertion, tobacco industry promotions, media and peer social influences, correction of social informational inaccuracies, advocacy (activism) techniques

2. Cognitive-behavioral: self-monitoring and coping skills, topography of tobacco use, seek out social support, relaxation, wait out urges, self-management, problem solving

3. Motivation enhancement: clarify desire for change and reduce ambivalence toward change (e.g., motivational interviewing, response-contingent reinforcement [reinforces quit-behavior with chance for money or prizes], stages-of-change techniques)

4. Medical: Ease physical effects of withdrawal, or emphasis on recovery from addiction

5. “Other”: Supply reduction (e.g., price increases or restricted access) and affect clarification approaches (e.g., clarify and remove conflicted affect)
Treatment Means: Current Analysis Stratified by Theory

- Theory
- Social influence (11) Current Estimate 4.34*
- Cognitive-behavior (22) 5.32*
- Motivation (22) 3.97*
- Medical (3) 15.86*
- Other (6) -0.17

Note. The information in parentheses indicates the number of studies in the current analysis; significant results for social influence, cognitive-behavior, and motivation, and now-medical. Too few studies for medical still to infer consistent effects.
## Treatment Means: Current Analysis

### Stratified by Modality

<table>
<thead>
<tr>
<th>Modality</th>
<th>Current Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom (11)</td>
<td>4.21*</td>
</tr>
<tr>
<td>School Clinics (29)</td>
<td>6.30*</td>
</tr>
<tr>
<td>Medical Clinics (9)</td>
<td>4.62*</td>
</tr>
<tr>
<td>Family (1)</td>
<td>19.10</td>
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<tr>
<td>System-Wide (6)</td>
<td>0.81</td>
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<tr>
<td>Computer (3)</td>
<td>5.40</td>
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<tr>
<td>Other Public Settings (5)</td>
<td>3.92</td>
</tr>
</tbody>
</table>

**Note.** The information in parentheses indicates the number of studies in the current analysis; significant results for classroom and school clinics; medical setting now shows a significant effect. Too few studies for computer or other public settings (and they are not yet significant effects). Only 1 family-based study.
# Treatment Means: Current Analysis Stratified by Number of Sessions

- **Number of sessions** | **Current Estimate**  
  - 1-4 (26) | 3.20  
  - 5-8 (20) | 6.24*  
  - 9+ (18) | 4.20*  

- Note. The information in parentheses indicates the number of studies in the current analysis; statistically significant equal to or greater than 5 sessions.
Other Youth Cessation Examinations

- Pharmacologic adjuncts
- Intensive contingency management
- Internet-based
- Telephone-based
- Mass media
- Policy
Review of Pharmacologic Adjunct (PA) Studies Among Teens

- 11 studies completed thus far, 8 RCTs
  - Generally CB+PA versus CB only (standard cessation counseling including instruction of coping skills) comparisons.
- Failed to show an incremental effect in 6 of the 8 RCTs
  - Mean effect last follow-up:
    - Nicotine gum=2.5% (2 controlled studies; 4% and 1%)
    - Nicotine patch=6% (4 controlled studies; 2%, 15%, 1%, and 0%)
    - Nicoteen spray=0% (1 controlled study; program did worse than control)
    - Buproprion=13% (3 controlled studies; 1%, 1%, and 37%)
    - Varenicline (Chantix/Champix)- in process
  - Thus far, a PA approach for teens is not promising
Intensive Contingency Management

- 30 teen smokers, RCT, CBT vs CM+CBT, 4 week period; 10/16 CM+CBT abstinent vs. 1/14 CBT, at 4-weeks (63% vs. 7%).
- 34 teen smokers, RCT, CM+CBT once/wk vs CM+CBT more frequent; high EOP quit rates but then 25% abstinence at 2 months across conditions.
  - Krishnan-Sarin et al., 2006 to present
  - Results look promising but only small pilots completed, high relapse rates, and can this approach be institutionalized?
Review of Internet Studies

- 4 studies completed thus far
  - 3 controlled studies; 2 studies reported quit data

- Internet + proactive phone calls + another program vs. other program only-favors use of internet with phone call; 14% vs. 7% 3-months (30-day quit rate)

- Internet vs. other program (brief office intervention (BOI) favored BOI; 13% vs. 6% 9 months (30-day quit rate); though % reduction favored internet program.
  - Basically no evidence for utility of the internet yet
  - Note. “Teen quit cessation” no longer connected to porn sites
     (Elliott and colleagues, 2001; Sussman, 2008, WHO)
Review of Telephone Studies

- 3 telephone studies: all controlled trials

- Telephone counseling vs. self-help booklets; 20% vs. 9% at 3-months (last 48 hours), at 6-months 10% vs. 3%, prolonged 9% vs. 2%

- State-wide telephone counseling; 4% difference in quit rates at 1-year follow-up (n=2151)

- Txt messaging personalized vs. control data collection-10% diff. 3-months, 1% diff. 6-months (7-day)

  - Telephone modality right now looks promising
  - Interactive personal contact seems important
Effects of a Media Campaign on Teen Smoking Cessation

- Four matched pairs of media markets in four states were randomized to receive or not receive a 3-year television/radio campaign aimed at adolescent smoking cessation based on social cognitive theory.
- 2,030 adolescent smokers (ave. age=15 y.o.; 987 experimental, 1,043 control; 54% and 58% baseline 30-day smoking, respectively)
- Assessed via annual telephone surveys for 3 years
- Typically, 10 television and 15 radio ads were aired each year. Yearly average of 660 ad placements on TV and 1,060 ad placements on radio.
- Past month quit rate significantly lower in the experimental than control at 3-year follow-up, adjusted for baseline smoking status (16% vs 12.8%).
- The media campaign did not impact targeted mediating variables. The role of theory-based constructs is unclear.
  - Solomon et al. (2009)
Policy Effects

• PRICE
  • Tauras & Chaloupka (1999) MTF H.S. seniors data
    – Price elasticity of male cessation ranges from 1.07 to 1.17 (average elasticity of 1.12).
    – Price elasticity of female cessation ranges from 1.17 to 1.21 (average elasticity of 1.19)
    – 10% increase in the real price of cigarettes increases probability of smoking cessation by approximately 11% and 12% for young men and women respectively
  • Maybe reduces teen prevalence 6-7% (Chaloupka, personal communication, 2007)
  • Tworek et al., in press, Health Policy: $1 increase → 20% to 30% increase quitting
  • Effects of price much less on chemical dependence clients

• SMOKING AREA RESTRICTION
  • State-level policies restricting smoking in private workplaces impacts probability of cessation among employed young adult females; Other restrictions in public locations no impact on female smoking cessation
  • In general, laws restricting smoking in private worksites and public places have no significant impact on young adult male smoking cessation decisions

• LIMITING RETAIL ACCESS
  • Limiting retail access, Chen & Forster (2006) 2-group experimental study, cross-sectional surveys of 8th, 9th, and 10th graders from 14 communities. Effect on reducing prevalence of daily smoking, effect found up to a 5-year follow-up; cessation of tobacco use per se not assessed. (Tworek-some support.)
Conclusions

• Why is teen tobacco use cessation worth the investment?
  – A 4% absolute effect over many years would lead to many life years saved (Wang et al. for prevention indicated a savings of $13K per LY saved); teen cessation programs likely are cost-effective
  – Recovery, cognitive-behavior, motivation combined programs with at least 5 sessions could obtain a 10% absolute difference, or doubling of quit rates in school-based or medical clinic settings
  – Relapse rates are lower than with adults
  – Policy, mass media, telephone, and clinic combinations would reach large numbers and might produce the largest effects
  – Institutional support, however, is the KEY