Teen Tobacco Use Cessation: 2010

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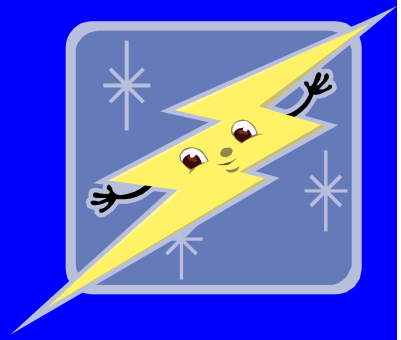

News about quality of studies

- 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.
- Duration of search January, 1970 through December 2007.
- 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 = VPprogam + VPcontrol.
- 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	Current Estimate
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	Current Estimate
Social influence (11)	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

Modality	Current Estimate
Classroom (11)	4.21*
School Clinics (29)	6.30*
Medical Clinics (9)	4.62*
Family (1)	19.10
System-Wide (6)	0.81
Computer (3)	5.40
Other Public Settings (5)	3.92

- 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