



TITLE: Smoking Cessation Interventions for Youth: Clinical Evidence and Guidelines

DATE: 06 February 2012

RESEARCH QUESTIONS

1. What is the clinical evidence regarding non-pharmacologic smoking cessation interventions for youth?
2. What are the evidence-based guidelines regarding non-pharmacologic smoking cessation interventions for youth?

KEY MESSAGE

Evidence suggests that non-pharmacologic smoking cessation interventions for youth can be effective for promoting smoking cessation behaviours.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2012, Issue 1), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. Methodological filters were applied to limit retrieval to health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, and guidelines. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2007 and January 23, 2012. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

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RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

One systematic review, nine randomized controlled studies, two non-randomized studies, and one evidence-based guideline regarding non-pharmacologic smoking cessation interventions for youth was identified. Additional references of potential interest are provided in the appendix.

OVERALL SUMMARY OF FINDINGS

One systematic review¹ assessed the long term effectiveness of behavioural interventions targeting cigarette use among children and youth and found that the evidence for effectiveness of community-based and multi-sectorial interventions were stronger than that for school-based interventions.

Eight randomized controlled trials and three non-randomized studies described non-pharmacologic smoking cessation interventions for youth and are summarized in Table 1.

Author, study type	Study design, population, size	Intervention and comparators	Outcomes
Horn 2011, RCT ²	Virginia high school teenagers 14-19 years who smoked >1 cigarette in previous 30 days N=233	Not on Tobacco teen cessation program Not on Tobacco + physical activity Brief intervention	- The Not on Tobacco + physical activity group had significantly higher cessation rates compared with other groups
Audrain-McGovern 2011, RCT ³	Adolescents N=355	5 sessions of motivational interviewing (MI) 5 sessions of structured brief advice (SBA)	- Adolescents who received MI were 60% less likely to try and quit smoking than those who received SBA - Adolescent who received MI showed a greater reduction in cigarettes smoked per day than those who received SBA - No statistically significant difference in smoking abstinence between MI and SBA groups
Flynn 2010, RCT ⁴	Grade 4-12 public school students N=19 966 surveyed pre-intervention N=23 246 surveyed post-intervention	Four simultaneous mass media campaigns based on behavioural theory disseminated through television and radio programming	- No significant impacts on smoking behaviours
Peterson 2009, RCT ⁵	Washington state senior high school smokers N=2151	Personalized telephone counseling to deliver motivational interviewing and cognitive behavioural skills training	- 21.8% achieved 6-month smoking abstinence with intervention vs 17.7% in control group

Table 1: Randomized controlled trials and non-randomized studies of non-pharmacologic smoking cessation interventions for youth.

Author, study type	Study design, population, size	Intervention and comparators	Outcomes
		Control (no intervention)	
Prokhorov 2008, RCT ⁶	Minority, inner-city high schools N=1160 (1098 nonsmokers, 62 smokers)	A Smoking Prevention Interactive Experience (ASPIRE) – computer-based smoking prevention and cessation curriculum Standard care – National Cancer Institute’s Clearing the Air self-help booklet	<ul style="list-style-type: none"> - There was a nonsignificant trend towards improved smoking cessation with ASPIRE - Not enough smokers were recruited to draw strong conclusions with respect to cessation
Pbert 2008, RCT ⁷	Pediatric primary care clinic patients 13-17 years N=2711	Brief counseling by pediatric provider followed by 1 visit and 4 telephone calls by 21-25 year old peer counselors Usual care	<ul style="list-style-type: none"> - Smokers who received intervention were more likely to report cessation at 6-month follow-up, but not 12-month follow-up
Campbell 2008, RCT ⁸	England and Wales students 12-13 years N=10 730	A Stop Smoking In School Trial (ASSIST) program – training influential students to act as peer supporters outside the classroom to encourage peers not to smoke Usual smoking education	<ul style="list-style-type: none"> - The odds of being a smoker in the ASSIST program compared with usual smoking education was 0.78
Helstrom 2007, RCT ⁹	Adjudicated adolescents N=81	Motivational enhancement therapy (MET) Education control	<ul style="list-style-type: none"> - Smoking behavior decreased in both groups, with 10% achieving 1-month smoking abstinence at 6-months follow-up - MET was effective for some adolescent smokers but contraindicated for those who have concomitant problems with alcohol use
Woodruff 2007, RCT ¹⁰	High school adolescent smokers N=136	Internet-based, virtual reality world combined with motivational interviewing conducted in real-time by a smoking cessation counselor Control	<ul style="list-style-type: none"> - Participants in the program were significantly more likely than controls to report (immediately post-intervention): smoking fewer days the past week, smoking fewer cigarettes the past week, or abstained from smoking during the past week - Significantly more people quit in the program group than control group at one year follow-up

Table 1: Randomized controlled trials and non-randomized studies of non-pharmacologic smoking cessation interventions for youth.

Author, study type	Study design, population, size	Intervention and comparators	Outcomes
Erol 2008, NRS ¹¹	High school adolescent smokers N=60	Motivational interviewing (MI)	- 18.3% quit smoking at 3 months; 33.3% at 6 months
Patten 2008, NRS ¹²	Adolescent smokers N=69	Brief office intervention (BOI) – 4 weekly individual sessions with a research counselor encompassing motivational interviewing and cognitive-behavioural techniques	- Percentage of adolescents who made improvement on readiness to quit from baseline treatment session was statistically significant for each of the 3 subsequent sessions

NRS=non-randomized study; RCT=randomized controlled trial

Non-pharmacologic smoking cessation interventions for youth appear to be moderately effective in promoting smoking cessation behaviours when delivered directly to the target population. Conversely, one study⁴ looking at the results of a mass media smoking cessation campaign found no significant impacts on smoking behaviours. No study had follow-up data beyond one year; therefore the impact of these interventions on long-term smoking cessation behaviours is unclear. Additional information regarding specific smoking intervention programs can be found in the appendix.

One evidence-based guideline¹³ was identified that provides guidance on mass media and point-of-sales interventions to prevent the uptake of smoking by youth under 18 years of age. The guideline recommends that mass media interventions should run for 3-5 years, be integrated with a national communications strategy to tackle tobacco use, and be developed in partnership with national, regional, local government and non-governmental organizations, media professionals, healthcare professionals, public relations agencies, local anti-tobacco activists, and youth.

REFERENCES SUMMARIZED**Health Technology Assessments**

No literature identified.

Systematic Reviews and Meta-analyses

1. Müller-Riemenschneider F, Bockelbrink A, Reinhold T, Rasch A, Greiner W, Willich SN. Long-term effectiveness of behavioural interventions to prevent smoking among children and youth. *Tobacco Control* [Internet]. 2008 [cited 2012 Feb 1];17:301-12. Available from: <http://tobaccocontrol.bmj.com/cgi/reprint/17/5/301>
Structured abstract available from: <http://www.crd.york.ac.uk/crdweb/ShowRecord.asp?AccessionNumber=12008105968&UserID=0>

Randomized Controlled Trials

2. Horn K, Dino G, Branstetter SA, Zhang J, Noerachmanto N, Jarrett T, et al. Effects of physical activity on teen smoking cessation. *Pediatrics* [Internet]. 2011 Oct [cited 2012 Feb 1];128(4):e801-e811. Available from: <http://pediatrics.aappublications.org/content/128/4/e801.long>
[PubMed: PM21930544](#)
3. Audrain-McGovern J, Stevens S, Murray PJ, Kinsman S, Zuckoff A, Pletcher J, et al. The efficacy of motivational interviewing versus brief advice for adolescent smoking behavior change. *Pediatrics*. 2011 Jul;128(1):e101-e111.
[PubMed: PM21690120](#)
4. Flynn BS, Worden JK, Bunn JY, Solomon LJ, Ashikaga T, Connolly SW, et al. Mass media interventions to reduce youth smoking prevalence. *Am J Prev Med* [Internet]. 2010 Jul [cited 2012 Feb 1];39(1):53-62. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2898197>
[PubMed: PM20537841](#)
5. Peterson AV, Jr., Kealey KA, Mann SL, Marek PM, Ludman EJ, Liu J, et al. Group-randomized trial of a proactive, personalized telephone counseling intervention for adolescent smoking cessation. *J Natl Cancer Inst* [Internet]. 2009 Oct 21 [cited 2012 Feb 1];101(20):1378-92. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2765261>
[PubMed: PM19822836](#)
6. Prokhorov AV, Kelder SH, Shegog R, Murray N, Peters R, Jr., Agurcia-Parker C, et al. Impact of A Smoking Prevention Interactive Experience (ASPIRE), an interactive, multimedia smoking prevention and cessation curriculum for culturally diverse high-school students. *Nicotine Tob Res*. 2008 Sep;10(9):1477-85.
[PubMed: PM19023839](#)
7. Pbert L, Flint AJ, Fletcher KE, Young MH, Druker S, Difranza JR. Effect of a pediatric practice-based smoking prevention and cessation intervention for adolescents: a randomized, controlled trial. *Pediatrics* [Internet]. 2008 Apr [cited 2012 Feb

- 1];121(4):e738-e747. Available from:
<http://pediatrics.aappublications.org/content/121/4/e738.long>
[PubMed: PM18381502](#)
8. Campbell R, Starkey F, Holliday J, Audrey S, Bloor M, Parry-Langdon N, et al. An informal school-based peer-led intervention for smoking prevention in adolescence (ASSIST): a cluster randomised trial. *Lancet* [Internet]. 2008 May 10 [cited 2012 Feb 3];371(9624):1595-602. Available from:
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2387195>
[PubMed: PM18468543](#)
9. Helstrom A, Hutchison K, Bryan A. Motivational enhancement therapy for high-risk adolescent smokers. *Addict Behav* [Internet]. 2007 Oct [cited 2012 Feb 3];32(10):2404-10. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2082126>
[PubMed: PM17428617](#)
10. Woodruff SI, Conway TL, Edwards CC, Elliott SP, Crittenden J. Evaluation of an Internet virtual world chat room for adolescent smoking cessation. *Addict Behav*. 2007 Sep;32(9):1769-86.
[PubMed: PM17250972](#)

Non-Randomized Studies

11. Erol S, Erdogan S. Application of a stage based motivational interviewing approach to adolescent smoking cessation: the Transtheoretical Model-based study. *Patient Educ Couns*. 2008 Jul;72(1):42-8.
[PubMed: PM18304775](#)
12. Patten CA, Decker PA, Dornelas EA, Barbagallo J, Rock E, Offord KP, et al. Changes in readiness to quit and self-efficacy among adolescents receiving a brief office intervention for smoking cessation. *Psychol Health Med*. 2008 May;13(3):326-36.
[PubMed: PM18569900](#)

Guidelines and Recommendations

13. National Institute for Health and Clinical Excellence. Mass-media and point-of-sales measures to prevent the uptake of smoking by children and young people [Internet]. NICE; 2008. 66 p. [cited 2012 Feb 3]. (NICE public health guidance 14). Available from:
<http://www.nice.org.uk/nicemedia/pdf/PH14fullguidance.pdf>

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APPENDIX – FURTHER INFORMATION:

Systematic Reviews and Meta-analyses – Quantitative Studies

14. Bauld L, Brandling J, Templeton L. Facilitators and barriers to the delivery of school-based interventions to prevent the uptake of smoking among children: a systematic review of qualitative research [Internet]. National Institute for Health and Clinical Excellence: London; 2009. 69 p. [cited 2012 Feb 3; revised July 2009]. Available from: <http://www.nice.org.uk/nicemedia/live/12827/47627/47627.pdf>
15. Uthman O, Yahaya I, Pennant M, Bayliss S, Aveyard P, Jit M, et al. School-based interventions to prevent the uptake of smoking among children and young people: effectiveness review [Internet]. University of Birmingham, West Midlands Health Technology Assessment Collaboration: Birmingham; 2009 Jul 30. 496 p. [cited 2012 Feb 3; revised July 2009]. Available from: <http://www.nice.org.uk/nicemedia/pdf/School-based%20interventions%20to%20prevent%20smoking%20-%20Quantitative%20Effectiveness%20review.pdf> Funded by the National Institute for Health and Clinical Excellence (NICE).

Randomized Controlled Trials - Evaluation of Specific Programs

16. Joffe A, McNeely C, Colantuoni E, An MW, Wang W, Scharfstein D. Evaluation of school-based smoking-cessation interventions for self-described adolescent smokers. Pediatrics [Internet]. 2009 Aug [cited 2012 Feb 3];124(2):e187-e194. Available from: <http://pediatrics.aappublications.org/content/124/2/e187.long>
[PubMed: PM19651564](#)
17. Sussman S, Miyano J, Rohrbach LA, Dent CW, Sun P. Six-month and one-year effects of project EX-4: a classroom-based smoking prevention and cessation intervention program. Addict Behav. 2007 Dec;32(12):3005-14.
[PubMed: PM17628346](#)
18. Vartiainen E, Pennanen M, Haukkala A, Dijk F, Lehtovuori R, de VH. The effects of a three-year smoking prevention programme in secondary schools in Helsinki. Eur J Public Health. 2007 Jun;17(3):249-56.
[PubMed: PM17208954](#)

Non-Randomized Studies – Evaluation of Specific Programs

19. Rice VH, Weglicki LS, Templin T, Jamil H, Hammad A. Intervention effects on tobacco use in Arab and non-Arab American adolescents. Addict Behav [Internet]. 2010 Jan [cited 2012 Feb 3];35(1):46-8. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2771915>
[PubMed: PM19767152](#)
20. Kohler CL, Schoenberger YM, Beasley TM, Phillips MM. Effectiveness evaluation of the N-O-T smoking cessation program for adolescents. Am J Health Behav. 2008 Jul;32(4):368-79.
[PubMed: PM18092897](#)

Review Articles

21. Curry SJ, Mermelstein RJ, Sporer AK. Therapy for specific problems: youth tobacco cessation. *Annu Rev Psychol* [Internet]. 2009 [cited 2012 Feb 3];60:229-55. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2811429>
[PubMed: PM19035825](#)

Additional References

22. Breland A, Colby S, Dino G, Smith G, Taylor M. Youth smoking cessation interventions: treatments, barriers and recommendations for Virginia [Internet]. Richmond (VA): Virginia Commonwealth University, Institute for Drug and Alcohol Studies; 2009 Dec. 60 p. [cited 2012 Feb 3]. Available from: [http://www.vcu.edu/idas/docs/Youth_Smoking_Cessation_Interventions_Report_\(final\).pdf](http://www.vcu.edu/idas/docs/Youth_Smoking_Cessation_Interventions_Report_(final).pdf)
23. Social Research Centre. National tobacco youth campaign evaluation [Internet]. Canberra: Australia Department of Health and Ageing; 2007 Jun. 67 p. [cited 2012 Feb 3]. Available from: <http://www.health.gov.au/internet/main/publishing.nsf/Content/phd-tobacco-ntyc-evaluation-report-2008>