Short-Term Effects of Smoke-free Kids: A RCT of a Home-based Smoking Prevention Program

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My Background

Amsterdam

Master of Public Health Research

Nijmegen

PhD student
Developmental Psychopathology
Smoking Prevalence: Youth

**Age 10:** 4%

**Age 11:** 9%

**Age 14:** 44%

**Age 17:** 63%

Stivoro (2010)
## Smoking trajectories

<table>
<thead>
<tr>
<th>Stage</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a. Non-smoking - preparation</td>
<td>Non-smoker and does not intend to smoke.</td>
</tr>
<tr>
<td>1b. Non-smoking - contemplation, preparation</td>
<td>Non-smoker and intends to smoke. Belief and attitude formation; susceptible to peer pressure.</td>
</tr>
<tr>
<td>2. Tried</td>
<td>Answers yes to “ever smoke,” has not smoked more than one or two cigarettes. Has not smoked in last year. May state they have tried but quit.</td>
</tr>
<tr>
<td>3. Experimenter</td>
<td>Smokes occasionally on an experimental basis. Does not intend to be a permanent smoker.</td>
</tr>
<tr>
<td>4. Regular</td>
<td>Smokes at least monthly, not as frequently as daily.</td>
</tr>
<tr>
<td>5. Established/daily smoker (dependent)</td>
<td>Smokes daily or almost daily. May smoke heavily on occasion. Smoking intensity is indicative of dependence.</td>
</tr>
</tbody>
</table>

*Mayhew, Flay, and Mott (2000)*
Predictors of Smoking Initiation

- Individual factors:
  - Smoking-related cognitions
  - Personality
  - Genetic influence

- Environmental factors
  - Influence of parents
    - Parental smoking
    - Parenting
      - General parenting
      - Smoking-specific parenting
  - Influence of peers
    - Peers smoking
    - Social acceptance
Smoking-related cognitions


- Attitude
- Self-efficacy
- Social norm

Intention

smoking onset
Anti-smoking socialization I

- Frequency & quality of communication
- Perceived maternal influence
- Anticipated maternal reaction
Anti-smoking socialization II

- House-rules
- Non-smoking agreement
- Availability of cigarettes

e.g., Emory et al. (2010); Den Exter Blokland et al. (2006); De Leeuw et al. (2010)
**Direct effect:**
Smoking behavior has influence on smoking behavior child

**Indirect effect:**
Anti-smoking socialization might be different between non-smoking and smoking parents

e.g. Engels & Willemsen, 2004; Harakeh et al., 2005; Jackson & Dickinson, 2003; 2006
To evaluate the short-term effects of ‘Smoke-free kids’ on smoking-specific parenting and smoking cognitions and the moderating role of parental smoking.

Hiemstra et al. (under review)
Smoke-free Kids

Home-based smoking prevention program based on socialization and communication theories

Developed in the US and adapted for the Dutch situation

Intervention program
<table>
<thead>
<tr>
<th>Intervention condition</th>
<th>Control condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 5 activity modules</td>
<td>- 5 Factsheets</td>
</tr>
<tr>
<td>- Tip sheet: background information and</td>
<td>- News letter</td>
</tr>
<tr>
<td>communication tips</td>
<td></td>
</tr>
<tr>
<td>- News letter</td>
<td>- No information that the mother need to</td>
</tr>
<tr>
<td>- Booster activity guide</td>
<td>discuss the booklet with their child.</td>
</tr>
<tr>
<td>- Designed for communication between</td>
<td>- Mother</td>
</tr>
<tr>
<td>mother and child</td>
<td></td>
</tr>
<tr>
<td>- Mother and child</td>
<td></td>
</tr>
</tbody>
</table>
Translation & adaption US program

- Translation of Magazines (Professional translator)
- Adaptation to Dutch situation and update of smoking information
- Modernization of design
US versus NL
Intervention magazines

1. General communication about smoking and makes parents and child comfortable with communicating about smoking

2. Concentrates on influence of smoking messages
Intervention magazines

3. Focuses on setting rules about smoking

4. Extension of magazine 3 and involves creating a smoke-free house and environment to keep the child away from second hand smoking.
5. Increases children's awareness regarding the influence of smoking classmates and friends and increases their ability to handle peer pressure.

Control magazines

Criteria for selecting factsheets:

• Same information would be available in local, state or national print or broadcast media

• Outside looks almost the same as the five intervention magazines
Recruitment

OR

[Images of recruitment process]
Inclusion criteria

9 to 11 years old

Mother or female guardian

Mother and child speak and read Dutch

One child per household
Data collection

20 min
Reward

In total for participation in all measurements

Five traveler’s checkes of €1000 are raffle among these families
**Timeline**

- **Baseline**: December 2008 - June 2009 by mother and child
- **Intervention program (5 months)**: February 2008 - September 2009 by mother and child
- **6 months follow-up**: July 2009 - November 2009 child
Method: Randomization

- Randomization level: school
- Stratification: number of asthmatic children
- Mothers and children were blinded to which condition randomization had occurred
I. Intention-to-treat (ITT) and completers-only analyses

• ITT: 20 multiple imputations (SPSS 19.0)
  - Continuous variables: predictive mean matching method
  - Categorical variables: logistic regression for categorical variables.
  - Pooling of effects
• Completers only
II. Lineair analyses:

• Step I Controlled for covariates and baseline measures of anti-smoking socialization or smoking cognitions
• Step II Moderation of parental smoking

III. Intraclass correlation coefficient (ICC) were calculated to determine the effects of school clustering

\[ \text{ICC antismoking socialization mean} = .05 \]
\[ \text{ICC cognitions mean} = .02 \]
Results: Participant flow

Baseline assessment
Mother (N = 1,490)
Child (N = 1,478)

Randomization (n = 1,478)

Intervention condition (n = 728)
Post intervention assessment (6 months) (n = 671)
• Refusal to participate further (n = 34)
• Lost to follow-up (n = 22)
• Other reasons (n = 1)

Control condition (n = 750)
Post intervention assessment (6 months) (n = 734)
• Refusal to participate further (n = 8)
• Lost to follow-up (n = 6)
• Other reasons (n = 2)

Analyzed ITT (n = 683)
Analyzed completers-only (n = 628)
Excluded from analyses
Baseline smoker (n = 45)

Analyzed ITT (n = 715)
Analyzed completers-only (n = 701)
Excluded from analyses
Baseline smoker (n = 35)

Excluded
• Only mother interviewed n = 12

Baseline smoker (n = 45)

Baseline smoker (n = 35)
Results: Baseline Characteristics I

N = 1398 mothers and non-smoking children

Gender:
- Female: 52.6%
- Male: 47.4%

Age = 10.1 years (SD = .78)

- Asthma: 14.1%
- Significant difference C & I: gender and asthma

- 98.2%
Results: Baseline Characteristics II

Education parents:

Technical & vocational training
(mother: 40.9%, father: 44.8%)

College & university
(mother: 38.0%, father: 40.5%)
## Results: Program effects (I)

### Anti-smoking socialization

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE</th>
<th>p</th>
<th>95% CI</th>
<th>R^2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency of communication</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention-to-treat</td>
<td>.11</td>
<td>.02</td>
<td>.000</td>
<td>.07 - .15</td>
<td>.29</td>
</tr>
<tr>
<td>Completers only</td>
<td>.12</td>
<td>.02</td>
<td>.000</td>
<td>.07 - .16</td>
<td></td>
</tr>
<tr>
<td><strong>Non-smoking agreement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention-to-treat</td>
<td>.07</td>
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<td>.001</td>
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<td>.23</td>
</tr>
<tr>
<td>Completers only</td>
<td>.08</td>
<td>.02</td>
<td>.001</td>
<td>.03 - .12</td>
<td></td>
</tr>
<tr>
<td><strong>Perceived maternal influence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention-to-treat</td>
<td>.09</td>
<td>.04</td>
<td>.03</td>
<td>.01 - .16</td>
<td>.06</td>
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</table>
## Results: Program effects (II)

### Smoking cognitions

<table>
<thead>
<tr>
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<th>B</th>
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<tr>
<td><strong>Self-efficacy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Intention-to-treat</td>
<td>-.09</td>
<td>.04</td>
<td>.02</td>
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<td>Completers only</td>
<td>-.10</td>
<td>.04</td>
<td>.03</td>
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<td></td>
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<tr>
<td><strong>Social norm friends</strong></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Intention-to-treat</td>
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<td></td>
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<tr>
<td><strong>Social norm best-friends</strong></td>
<td></td>
<td></td>
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<td>Intention-to-treat</td>
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</table>
Results: Smoking behavior parents

No moderating effect was found of parental smoking
Results: Intervention Integrity

- *Intervention condition:* 82% of the children and mothers reported they read and completed at least 3 out of 5 activity modules.

- *Control condition:* 74% report to have read and completed 3 from the 5 activity modules.
Limitations

I. No information of the effect of the program on the actual smoking onset of the adolescents.

II. Self-reports

III. Focus on mothers instead of both parents
  • Mothers are more positive about anti-smoking socialization than fathers (Engels & Willemsen, 2004; Harakeh et al., 2005)
Conclusions

Smoke-free Kids program effects (6 months):

I. Anti-smoking socialization
   Increase in frequency of communication
   More mothers and children set up a non-smoking agreement
   More perceived maternal influence

II. Smoking cognitions
   Lower self-efficacy
   Lower social norm of friends, best friend

III. No moderating effect for parental smoking

Smoke-free Kids showed promising results in changing anti-smoking socialization and smoking cognitions on the short term. Long-term follow-up assessments including children’s smoking are needed.
Publications on Smoke-free Kids


Questions?

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