Taking messages about breast cancer and smoking online: New directions for reducing tobacco exposure among girls

Joan L. Bottorff, Jodie Stevens, Laura L. Struiik and Chris G. Richardson
Smoking affects more than lungs...

- Tobacco smoke contains approximately 20 mammary carcinogens (California Environmental Protection Agency, 2005).

- Exposure to tobacco smoke linked to premenopausal breast cancer (Collishaw et al., 2009; Johnson, 2012).

- Vulnerability high during breast cell growth (Innes & Byers, 2001; Lash & Aschengrau, 1999; Okasha, McCarron, Gunnell, & Smith, 2003).
Goal: To raise awareness among youth about girls’ increased risk for breast cancer (BC) when exposed to tobacco smoke

Objectives:

- To develop gender- and Aboriginal-tailored messages
- To evaluate youths’ responses to tailored messages
Program of Research

**START** is nested in the British Columbia Adolescent Substance Use Survey (BASUS)

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<thead>
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<tbody>
<tr>
<td><strong>START</strong></td>
<td>Phase 1 BASUS data used to identify and characterize groups based on smoking status, gender and ethnicity</td>
<td>Phase 2 Message development (Qualitative; focus groups)</td>
<td>Phase 3 Message delivery and evaluation using a randomized trial (including a partial cross-over) nested within the ongoing BASUS cohort study</td>
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Message Development Phase

- Message strategies developed via 8 focus groups
  - 43 youth aged 12 to 17
    - 18 female
    - 20 of Aboriginal descent
Tailored START Messages

Girls’ Messages

Smoking affects more than your lungs.

Cigarette smoke, even second hand smoke, puts girls at risk of breast cancer at an early age.

Avoid places where you and your friends are exposed to second hand smoke.

If you smoke, think about quitting. Do it for yourself and for all the girls you know.

Boys’ Messages

Hey guys, show you care!
Respect the girls around you by not exposing them to second hand smoke.

Smoking affects more than girls’ lungs.
Second hand smoke increases their risk of breast cancer at an early age.

If you smoke, think about quitting. Do it for yourself and for all the girls you know.

Note: Please do not copy without permission of the authors.
WARNING
YOU’RE NOT THE ONLY ONE SMOKING THIS CIGARETTE

The smoke from a cigarette is not just inhaled by the smoker. It becomes second-hand smoke, which contains more than 50 cancer-causing agents.

Health Canada
START: RCT Phase

Randomly assigned 84 schools (N=1498)

Intervention Group
(START messages, n=655)

Impact Evaluation
(6 months post-delivery)

Impact Evaluation
(12 months post-delivery)

Control Group
(Standard message, n=843)

Impact Evaluation
(6 months post-delivery)

Receive START Messages

Impact Evaluation
(6 months post-delivery)
Measures

- Demographics
- Smoking behaviour
- Message viewing time
- Perceived risk
- Worry
- Information-seeking
<table>
<thead>
<tr>
<th>Participant Characteristics</th>
<th>Intervention n (%)</th>
<th>Control n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>310(48)</td>
<td>348(42)</td>
</tr>
<tr>
<td>Female</td>
<td>339(52)</td>
<td>491(59)</td>
</tr>
<tr>
<td><strong>Age in years</strong>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>92(14)</td>
<td>172(21)</td>
</tr>
<tr>
<td>14</td>
<td>351(54)</td>
<td>480(57)</td>
</tr>
<tr>
<td>15</td>
<td>206(32)</td>
<td>187(22)</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aboriginal</td>
<td>71(11)</td>
<td>96(11.8%)</td>
</tr>
<tr>
<td>Other</td>
<td>555(89)</td>
<td>717(88)</td>
</tr>
<tr>
<td><strong>Family member has had BC</strong></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>153(25)</td>
<td>154(20)</td>
</tr>
<tr>
<td><strong>Have tried smoking tobacco</strong></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>60(9)</td>
<td>104(12)</td>
</tr>
<tr>
<td><strong>Does anyone smoke in your home...?</strong></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>60(9)</td>
<td>107(13)</td>
</tr>
<tr>
<td><strong>Past month’s exposure to SHS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Every day</td>
<td>20(3)</td>
<td>35(4)</td>
</tr>
<tr>
<td>Almost every day</td>
<td>70(11)</td>
<td>79(10)</td>
</tr>
<tr>
<td>At least once a week</td>
<td>153(24)</td>
<td>236(28)</td>
</tr>
<tr>
<td>At least once in past month</td>
<td>281(44)</td>
<td>347(43)</td>
</tr>
<tr>
<td>Never</td>
<td>110(17)</td>
<td>119(15)</td>
</tr>
<tr>
<td><strong>Tobacco identified as a risk factor for BC</strong></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>172(27)</td>
<td>208(25)</td>
</tr>
</tbody>
</table>
Exposure to intervention
Time spent reading messages

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Girls</td>
<td>36</td>
<td>28</td>
</tr>
<tr>
<td>Boys</td>
<td>38</td>
<td>25</td>
</tr>
</tbody>
</table>

START
Supporting Tailored Approaches to Reducing Tobacco
Post-intervention relative risk

- My smoking increases my risk of BC (smoking girls) 0.84€
- If I start smoking, it will increase my risk of BC (non-smoking girls) 1.14 €€ **
- Exposure to SHS increases my risk of BC (all girls) 1.14 €€ **
- Exposure to SHS increases girls' risk of BC (all girls) 1.14 €€ **
- Exposure to my SHS increases BC risk of the girls I spend time with (smoking girls) 1.13 €
- Exposure to SHS increases girls' risk of BC (all boys) 1.10 €€ *
- Exposure to my SHS increases BC risk of the girls I spend time with (smoking boys) 1.10 €

€ Unadjusted RR due to small sample size
€€ Adjusted RR for age, family history of BC, smoking status of family and peers, and having tried cigarettes.
*p<0.01, **p<0.001
Post-intervention worry

I am worried that I could get BC because I am exposed to someone else's SHS (all girls) - 1.17
I am worried that I could get BC because of my cigarette smoking (smoking girls) - 0.87
I am worried that I could get BC if I started smoking cigarettes (non-smoking girls) - 1.15*
I am worried that SHS from other peoples' cigarette smoke increases girls' risk for getting BC (all girls) - 1.16*
I am worried that SHS from my cigarette smoking increases the BC risk of the girls that I spend time with (smoking girls) - 1.50
I am worried that SHS from other peoples' cigarette smoke increases girls' risk for getting BC (all boys) - 1.08
I am worried that SHS from my cigarette smoking increases the BC risk of the girls that I spend time with (smoking boys) - 1.15

*p<0.01
Interest in receiving more information

Girls: 1.52*
Boys: 0.63*

*p<0.01
Making sense of the results...

- Positively framed, gender-specific messages appear to increase awareness.
- Girls’ response may be related to physical/social changes with transition to womanhood.
- Masculine norms can be repositioned to promote young men’s involvement in girls/women’s health issues.
- Interactive technologies hold promise for cost-effective, gendered health promotion.
Knowledge Translation

- Information for girls and boys
  - About risk
  - Strategies to decrease girls’ risk
Teaching Kits

- PowerPoint presentation and lesson plan for teachers

**Smoking Affects More Than The Lungs**

**New Research**

Young women are at risk of developing breast cancer when:

- They smoke cigarettes
- Are exposed to secondhand smoke

**Cigarette Smoke Chemicals**

- 256 harmful chemicals
- 20 breast cancer causing chemicals
- 70 cancer causing chemicals

**Reflection Activity:**

Where are you exposed to secondhand smoke?
Online resources for girls and boys
ePostcards

- Sent by email or through social media websites

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Avoid places where you and your friends are exposed to second hand smoke.

If you smoke, think about quitting. Do it for yourself and for all the girls you know.

Hey guys, show you care! Respect the girls around you by not exposing them to second hand smoke.

Smoking affects more than girls’ lungs. Second hand smoke increases their risk of breast cancer at an early age.

If you smoke, think about quitting. Do it for yourself and for all the girls you know.

START
Supporting Tailored Approaches to Reducing Tobacco
Videos
## Girls’ Feedback

### Survey Results

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I want to share this video with my friends/family</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I learned something new from this video</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This video should be available on YouTube</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I think that all teens should watch this video</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protecting myself from cigarette smoke is important</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am worried that exposure to cigarette smoke increases my risk for cancer</td>
<td></td>
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</tr>
</tbody>
</table>
Boys’ Feedback

- I want to share this video with my friends/family
- I learned something new from this video
- I think that all teens should watch this video
- This video should be available on YouTube
- Exposure to cigarette smoke increases girls’ risk for breast cancer
- I am worried that exposure to cigarette smoke increases girls’ risk for breast cancer

![Bar Chart]

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

0% 20% 40% 60% 80% 100%
- Interactive online quizzes
- Infographics
- YouTube video – the biology behind the risk
- YouTube video – breast cancer awareness for young women
Conclusion
Acknowledgements

- **Additional team members**

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  - Canadian Breast Cancer Research Alliance
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  - Think Media, Media Button
For further information:

Dr. Joan L. Bottorff
Institute for Healthy Living and Chronic Disease Prevention
UBC’s Okanagan Campus, Kelowna

E: Joan.bottorff@ubc.ca

Dr. Chris Richardson
School of Population and Public Health
UBC’s Vancouver campus

E: Chris.richardson@ubc.ca


