Integrity and Excellence in Field Epidemiology

A Nested Case-Control Study Among Elementary Students in a Public School on Fireworks Use

During the New Year Celebration, Philippines, 2012

AR De Guzman, MD, MCHM; VC de los Reyes, MD; MN Sucaldito, MD; EA Tayag, MD; FPMSID
Field Epidemiology Training Program, National Epidemiology Center, Department of Health, Philippines

BACKGROUND

Fireworks Injury Prevention Program
- Note to decrease fireworks-related injuries and deaths
- Campaign Slogan: Iwas Paputok (Avoid Fireworks Use) (Call to Action: Fireworks Injury Reduction)

RESULTS

Profiles of Students

Table 3. Reasons for Fireworks Non Use Among Students (n=703)

<table>
<thead>
<tr>
<th>Reason</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>363</td>
<td>51%</td>
</tr>
<tr>
<td>Female</td>
<td>340</td>
<td>49%</td>
</tr>
<tr>
<td>AGE RANGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 years (n=154)</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>6-10 years (n=309)</td>
<td>44%</td>
<td></td>
</tr>
<tr>
<td>11-14 years (n=310)</td>
<td>44%</td>
<td></td>
</tr>
<tr>
<td>MEDIAN AGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 years</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- 51% (74%) students knew an individual who used fireworks
- 521 (74%) students knew an individual who used fireworks among the 703 students (N=703)
- 320 (46%) students knew an individual who used fireworks among 703 students (N=703)
- 383 (54%) students knew an individual who used fireworks among 703 students (N=703)
- 21% were from the 6-10 years age group
- 30% were male injuries
- 90% were female injuries

Survey at Cecilio Apostol Elementary School, October 8, 2012

OBJECTIVES

1. To determine the percentage of students who used fireworks
2. To determine the percentage of students who knew the 2011 campaign slogan
3. To identify which campaign slogans would be most remembered by the students
4. To identify which images would prevent or stop students from using fireworks
5. To identify factors associated with fireworks use among the students
6. To recommend a campaign slogan for the 2012 fireworks injury prevention program

Descriptive Study
- Calculated sample size
- Conducted a survey using a standardized questionnaire
- 2011 and 2012 data collected using Epi Info 3.5.3

Analyze Study
- Nested case-control

Case Definition
- A Grade 5-7 student enrolled at Cecilio Apostol Elementary School who used fireworks during the 2011 Christmas or New Year celebrations.

A Control was a Grade 5-7 student enrolled at Cecilio Apostol Elementary School who did not use fireworks during the 2011 Christmas or New Year celebrations.

CONCLUSIONS

1. Majority of the students did not use fireworks
2. Reasons for not using fireworks were fear of being injured and following parental advice.

3. The best remembered slogan in 2011 was "Avoid Fireworks Use".
   - Avoid Fireworks Use: 136 (21%)
   - Aggressive Fireworks Use: 58 (9)
   - 2011 Slogan: 114 (16)

4. Cases were 4X more likely to know other individuals who also used fireworks than controls
5. Cases were 2X more likely to know other individuals who used fireworks than controls

- A Grade 5-7 student enrolled at Cecilio Apostol Elementary School who used fireworks during the 2011 Christmas or New Year celebrations

WHAT HAPPENED NEXT?

1. Personalized the results and recommendations to involved Department of Health officials
2. Developed new health promotional strategies with stakeholders

Table 4. Campaign Slogan Best Remembered by Students (N=703)

<table>
<thead>
<tr>
<th>Slogan</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid Fireworks Use</td>
<td>136</td>
<td>21%</td>
</tr>
<tr>
<td>Aggressive Fireworks Use</td>
<td>58</td>
<td>9%</td>
</tr>
<tr>
<td>2011 Slogan</td>
<td>114</td>
<td>16%</td>
</tr>
</tbody>
</table>

Table 5. Analysis of Factors Affecting Fireworks Use

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds Ratio (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Individuals Who</td>
<td>4.327</td>
<td>0.0005</td>
</tr>
<tr>
<td>Used Fireworks</td>
<td>(3.083-6.717)</td>
<td></td>
</tr>
<tr>
<td>Poster 4</td>
<td>1.6495</td>
<td>0.0095</td>
</tr>
<tr>
<td>(1.083-2.5104)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Student Demographics (N=703)

<table>
<thead>
<tr>
<th>Variable</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>363</td>
<td>51%</td>
</tr>
<tr>
<td>Female</td>
<td>340</td>
<td>49%</td>
</tr>
<tr>
<td>AGE RANGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 years (n=154)</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>6-10 years (n=309)</td>
<td>44%</td>
<td></td>
</tr>
<tr>
<td>11-14 years (n=310)</td>
<td>44%</td>
<td></td>
</tr>
<tr>
<td>MEDIAN AGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 years</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- 2011 Slogan changed to APIR (Avoid Fireworks Use)
- Campaign Slogan: Iwas Paputok (Avoid Fireworks Use)

DISCUSSION AND RECOMMENDATIONS

Risk Factors for Fireworks Use

- Lack of knowledge on dangers of fireworks use
- No policy banning use of fireworks by children

Interventions to Prevent/Stop Fireworks Use

- Health education for family and friends
- `Leady survey on campaign slogan
- Yearly survey on fireworks use
- Creation of policies banning: 1. Sale of fireworks to minors
  2. Use of fireworks by minors

WHAT DID WE DO RIGHT?

- Prevention of Fireworks-Related Injuries
- Creation of policies banning: 1. Sale of fireworks to minors
  2. Use of fireworks by minors
- Use of alternative modes of entertainment during celebrations

- 2012 Fireworks Injury Surveillance Results:
  - Decrease of 50% (99%) cases in 2012 vs. 2011
  - Decrease of 3 (3%) deaths in 2012 vs. 2011
  - Decrease of 37 (13%) cases among <10 years in 2012 vs. 2011
  - Decrease of 3 (75%) deaths in 2012 vs. 2011

- Post 2012 New Year Celebration Survey at Cecilio Apostol, Manila, March 2013:
  - Decrease of 28% of students who used fireworks

- Interventions to Prevent/Stop Fireworks Use:
  - Prevention of Fireworks-Related Injuries
  - Creation of policies banning: 1. Sale of fireworks to minors
  - Use of alternative modes of entertainment during celebrations

- Post 2012 New Year Celebration Survey at Cecilio Apostol, Manila, March 2013:
  - Decrease of 28% of students who used fireworks

- 2012 Fireworks Injury Surveillance Results:
  - Decrease of 50% (99%) cases in 2012 vs. 2011
  - Decrease of 3 (3%) deaths in 2012 vs. 2011
  - Decrease of 37 (13%) cases among <10 years in 2012 vs. 2011

- Post 2012 New Year Celebration Survey at Cecilio Apostol, Manila, March 2013:
  - Decrease of 28% of students who used fireworks

- Interventions to Prevent/Stop Fireworks Use:
  - Prevention of Fireworks-Related Injuries
  - Creation of policies banning: 1. Sale of fireworks to minors
  - Use of alternative modes of entertainment during celebrations

- Post 2012 New Year Celebration Survey at Cecilio Apostol, Manila, March 2013:
  - Decrease of 28% of students who used fireworks

- Interventions to Prevent/Stop Fireworks Use:
  - Prevention of Fireworks-Related Injuries
  - Creation of policies banning: 1. Sale of fireworks to minors
  - Use of alternative modes of entertainment during celebrations