Risk Perception and Communication following an exposure event at a wood treatment plant: A before and after study

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Introduction

- New high heat timber kiln
- No chemical preservatives
  - Ecological/Workplace benefits?
- Products of incomplete combustion
Background

- Three short term exposures (hours)
- Anecdotal health issues – Skin, URT, Headache

18 months later: Our invitation
- Assess and communicate risks
- High level of worker health concern
- In-house risk communication not effective

Research Hypothesis

Risk communication will improve understanding of risks, and attenuate concern levels.
Risk communication gone astray..
Methodology

Before and after study
  Intervention is Risk communication

Participants:
  113 volunteers (of 197 total population)
  Written consent - purpose of study

Initial: Medical interview/assessment
  Rapport, Listening*
  then deliver questionnaire

Intervention

- Report Delivery
- Written information
- Video presentation
## Population

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>96%</td>
</tr>
<tr>
<td>Female</td>
<td>4%</td>
</tr>
<tr>
<td>Age &gt;40 years</td>
<td>65%</td>
</tr>
<tr>
<td>NZ European</td>
<td>79%</td>
</tr>
<tr>
<td>NZ Maori</td>
<td>16%</td>
</tr>
<tr>
<td>Ethnicity Other</td>
<td>5%</td>
</tr>
</tbody>
</table>

Demographics of Participants (Total 113)
Delivered before and after risk communication intervention

1. Have they received information?
2. Has it allowed them to understand the risks?
3. At the time of exposure were they concerned about the health effects?
4. Are they concerned about the health effects now?
**Questionnaire**

1. I have received information about the potential health effects from exposure to TMT kiln emissions:

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
</table>

2. The information provided to me has allowed me to understand risks to my health:

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
</table>

3. At the time of TMT kiln emissions I had concerns for my health because of exposures:

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
</table>

4. Currently I have concerns for my health because of past exposures to TMT kiln emissions:

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
</table>
Q1. Received information re: health effects?

![Bar chart showing Likert Level Response](image)
Q2. Information Allowed Understanding of risks?

![Bar Chart]

- Frequency
- Likert Level Response
- Pre
- Post
Q3. Health concerns at time of exposures?
Q4. Current health concerns re: exposures?

![Bar chart showing Likert level responses for 'Pre' and 'Post' with frequency on the y-axis and Likert level response on the x-axis.]
## Results – Paired t-tests

<table>
<thead>
<tr>
<th></th>
<th>Mean change</th>
<th>Lower CI (95%)</th>
<th>Upper CI (95%)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>1.26</td>
<td><strong>0.94</strong></td>
<td>1.58</td>
<td><strong>&lt;0.001</strong></td>
</tr>
<tr>
<td>Q2</td>
<td>1.24</td>
<td><strong>0.93</strong></td>
<td>1.54</td>
<td><strong>&lt;0.001</strong></td>
</tr>
<tr>
<td>Q3</td>
<td>-0.1</td>
<td>0.01</td>
<td>-0.21</td>
<td>0.072</td>
</tr>
<tr>
<td>Q4</td>
<td>-1.21</td>
<td><strong>-0.95</strong></td>
<td>-1.48</td>
<td><strong>&lt;0.001</strong></td>
</tr>
</tbody>
</table>

Students Paired T-tests of before and after statement responses
Analysis

- Chance (p-values)
- Bias – Ethnicity 5/6 loss to follow up
- Systematic bias?
  - Our Interaction, medical assessment
  - ? Pressure from company -> Response – desirable?
- Confounding – Time since exposure/symptoms
Strengths and Limitations

Limitations:
- Before and After Study
- \(\downarrow\) Generalisability

Strengths:
- High Retention rate - 79% response
- Question 3 consistency of response
  - Response validation for Q1,2 and 4?
Clinical Relevance

- Occupational Physicians
- Risk communication

Initial rapport, independence and trust* established – Improves risk communication and perception


Future

- Further work:
  - Risk communication effects!
  - Benefit to health of workers, trust relationship
    - Psychological wellbeing

- Comparison group

- (Feedback back to the company – policy/planning)
GOOD RISK COMMUNICATION:

AS CAPTAIN OF THIS FLIGHT, I DEEPLY REGRET HAVING TO INFORM YOU THAT WE ARE ABOUT TO CRASH.