Perceptions of food safety risk, control and responsibility among vulnerable consumer groups
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Pregnant women, chemotherapy patients and older adults had significantly different perceptions of risk, control and responsibility, indicating a need for targeted food safety education. However, to be effective, education interventions must also address ‘optimistic bias’, ‘personal invulnerability’ and ‘illusion of control’.

Older adult consumers
Among older adults, significant differences were determined between perceived ‘personal’ risk, control and responsibility, compared with ‘others’ (p<0.001). Older adults perceived ‘themselves’ to have lower levels of risk than ‘others’ suggesting perceptions of ‘optimistic bias’ and ‘personal invulnerability’. Perceived greater levels of ‘personal’ control and responsibility, compared to ‘others’, suggest perceptions associated with ‘illusion of control’. Those aged ≥ 80 years, perceived higher levels of risk, and lower levels of control and responsibility.

People receiving chemotherapy treatment
Prior to cancer diagnosis, respondents perceived themselves (or those they care for) to be at a lower risk of food poisoning than the general population, indicating ‘optimistic bias’ and ‘personal invulnerability’. Correlations were determined between perceptions of risk, control and responsibility. Perceptions of risk, control and responsibility were also perceived to be significantly lower (p<0.05) during chemotherapy treatment than before cancer diagnosis.

Although respondents perceived an increased risk of food poisoning during chemotherapy, ‘other people undergoing chemotherapy’ were perceived as having a greater level of risk, indicating ‘optimistic bias’ and ‘personal invulnerability’ remains during treatment. An increase in perception of control during treatment may indicate the illusion of control among patients and carers, suggesting that patients and carers may not take sufficient measures to safeguard food during foodborne illness.

significant differences in perceptions of risk and control during chemotherapy treatment were determined between those that recalled receiving food safety information (recipients) and those that did not recall receiving food safety information (non-recipients): (risk: significantly greater among receivers (mean 5.9) than non-recipients (mean 4.7)); (control: significantly greater among receivers (mean 7.7) than non-recipients (mean 7.5)); (responsibility: no significant differences).

Women during pregnancy
Perceptions of risk, control and responsibility during pregnancy were non-correlated (p>0.05), suggesting perceived food poisoning risk during pregnancy was perceived to be beyond individual control and responsibility. Findings suggest that heightened risk perceptions among pregnant women may increase likelihood of engagement with food safety education provided for pregnant women in the UK, which may assist to improve food safety practices during pregnancy.

No significant differences were determined between pregnant women and post-partum women (p>0.05).

Perceptions of risk, control and responsibility among vulnerable consumer groups
Perceptions of risk, control and responsibility were compared for the three vulnerable consumer groups to establish if any significant differences existed:
• Perception of risk was significantly lower among older adults than pregnant women and chemotherapy patients (p<0.001).
• Perception of control was significantly lower among caregivers and patients when receiving chemotherapy treatment (p<0.001).
• No significant differences were determined in perceptions of responsibility for older adults than pregnant women and chemotherapy patients (p>0.05).

Table 1: Perceptions of risk, control and responsibility for foodborne illness among older adult consumers (n=105), pregnant and post-partum women (n=86), chemotherapy patients (n=103) and caregivers of chemotherapy patients (n=42)

<table>
<thead>
<tr>
<th>Perception of risk</th>
<th>Mean (n)</th>
<th>Women during pregnancy</th>
<th>Chemotherapy patients (n=103)</th>
<th>Chemotherapy caregivers (n=42)</th>
<th>Kruskal Wallis p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk</td>
<td>2.1</td>
<td>4.3</td>
<td>5.2</td>
<td>5.5</td>
<td>0.001</td>
</tr>
<tr>
<td>Control</td>
<td>8.3</td>
<td>7.7</td>
<td>7.6</td>
<td>7.5</td>
<td>0.001</td>
</tr>
<tr>
<td>Responsibility</td>
<td>8.9</td>
<td>8.5</td>
<td>7.9</td>
<td>8.6</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Conclusion
Despite significant differences in the perceptions of risk, control and responsibility among the vulnerable groups that participated in this study, findings indicate ‘optimistic bias’ and ‘personal invulnerability’ and ‘illusion of control’ which may hinder engagement with food safety educational interventions. As perceptions regarding the risk of foodborne illness and the control of foodborne illness were determined to be significantly different among the vulnerable groups, there is a need to establish the specific factors that may influence such food safety perceptions to enable the development of highly focused, targeted food safety educational interventions to increase awareness and enable behavioural change.