

Perceptions of food safety risk, control and responsibility among vulnerable consumer groups

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Introduction

Due to immune suppression certain consumer groups have an increased risk of foodborne illness. Immune suppression can occur at different life stages due to different factors:

- **Pregnant women:** Placental exosomes are immunosuppressive which cause maternal immune modulation during pregnancy (Stenqvist, 2014).
- **Older adults:** Immunosenescence, defined as changes in the innate and adaptive immune response associated with increased age, increases susceptibility to infection (Busse and Mathur, 2010).
- **People receiving chemotherapy treatment:** chemotherapy induced immunosuppression, due to cytotoxic drugs, increases susceptibility of patients to opportunistic pathogens (Rasmussen and Arvin, 1982).

Although vast consumer food safety knowledge and self-reported data exist, there is a lack of attitudinal data detailing perceptions of risk, control and responsibility. Such attitudinal data relating to vulnerable groups, including older adults, and people receiving chemotherapy treatment are particularly lacking (Evans and Redmond, 2014).

Perceptions of food related risks may be lifestyle-related and if consumers underestimate personal risks they may not take appropriate steps to reduce the hazard (Frewer *et al.*, 1995).

Perception determination is essential in consumer food safety research to facilitate a comprehensive insight to cognitive factors that may impact behaviour. Perceptual data can inform the development of effective, targeted food safety educational interventions, it is essential to target food safety educational attempts for specific vulnerable consumer groups according to attitudinal perceptions (Redmond and Griffith 2004; Evans and Redmond, 2019).

Purpose

The aim of this study was to explore the perceptions of risk, control and responsibility relating to food safety among three identified groups that have an increased risk of foodborne infection; older adults, chemotherapy patients and pregnant women.

Methods

Questions using a variation of a 10-point visual analogue scale were developed to determine perceptions of risk, control and responsibility relating to food safety. Different data collection methods were utilised for different consumer groups.

- Older adults (≥ 60 years) ($n=100$) participated in a computer-assisted personal interview
- Chemotherapy patients ($n=121$) and family caregivers ($n=51$) completed an online-questionnaire
- Pregnant women ($n=16$) and post-partum (≤ 12 months) women ($n=24$) participated in a paper based self-complete questionnaire

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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 that 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 greater ($p<0.05$) 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 domestic food preparation to reduce the risks associated with foodborne illness.



Significant differences in perceptions of risk and control during chemotherapy treatment were determined between those that recalled receiving food safety information (receivers) and those that did not recall receiving food safety information (non-receivers):

- RISK: Significantly greater among receivers (mean 5.9) than non-receivers (mean 4.7) ($U=1531.5$, $z=-2.097$, $p<0.05$, $r=-0.2$).
- CONTROL: Significantly greater among receivers (mean 7.7) than non-receivers (mean 7.5) ($U=1549.0$, $z=-2.077$, $p<0.05$, $r=-0.2$).
- RESPONSIBILITY: No significant differences in perceived responsibility for food safety between receivers and non-receivers ($p>0.05$).

Women during pregnancy



- Perceptions of risk, control and responsibility during pregnancy were not correlated ($p>0.05$), suggesting perceived food poisoning risk during pregnancy is perceived to be beyond individual control and responsibility.
- Findings suggest that heightened risk perceptions among pregnant women may increase likelihood of engaging 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 ($n=100$), pregnant and post-partum women ($n=40$), chemotherapy patients ($n=103$) and caregivers of chemotherapy patients ($n=42$).

	Older adult consumers ($n=100$)	Women during pregnancy ($n=40$)	Chemotherapy patients ($n=103$)	Chemotherapy caregivers ($n=42$)	Kruskal Wallis Test
Perception of risk (1: Very low risk – 10: Very high risk)	2.1	4.0	5.2	5.5	$\chi^2(3) = 64.699$, $p<0.001$
Perception of control (1: No control – 10: Total control)	8.3	7.7	7.6	7.5	$\chi^2(3) = 185.527$, $p<0.001$
Perception of responsibility (1: No responsibility – 10: Total Responsibility)	8.9	8.5	7.9	8.6	$\chi^2(3) = 4.648$, $p>0.05$

Despite significant differences between 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.

Conclusion

- Cumulatively, perceptions of invulnerability, optimistic bias and illusion of control regarding foodborne illness exist among vulnerable consumer groups. Such perceptions may undermine educational attempts.
- Findings indicate significant differences in perceptions of risk and control between vulnerable groups.
- Consequently, findings indicate food safety messages for vulnerable patient groups need to be tailored and targeted to overcome such perceptions.