He is worse than I am: The positive outlook of food handlers about foodborne disease

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Abstract

The objective of this study was to identify and characterize the optimistic bias (OB) phenomenon in food handlers in relation to foodborne disease. This study examined 176 food handlers from different food businesses in Santos – Brazil, as follows: street food kiosks, beach kiosks, restaurants, hospitals, and school meal services. The individuals indicated their own risk and their peers' risk of causing a foodborne disease through a 10 cm linear scale anchored by descriptors of intensity ranging from “none” to “very high”. The difference between these risk perceptions characterized the OB score. Food handlers perceived themselves as less likely than their peers to transmit a foodborne disease to the consumer ($p < 0.01$) and less likely than other food handlers to transmit foodborne disease to their friends and family members ($p < 0.01$). A food handler believes that other food handlers are worse than he or she is. Environmental characteristics can empower food handlers and increase their OB, as observed among schools' and hospitals' food handlers. Understand food handlers' perceptions can enable the discussion of different effective strategies of training.

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1. Introduction

“Because it won't happen to me!” This is a common answer when people are questioned about their likelihood of being affected by harm (Mckenna, 1993), primarily when they believe that they have control over the situation (Kos & Clarke, 2001; Weinstein, 1987). This positive outlook regarding future events, in which individuals consider themselves to be less likely than others to experience negative events, is called optimistic bias (OB) or unrealistic optimism (Gouveia & Clarke, 2001; Weinstein, 1984).

Individuals do not make the same estimates of risk when examining risks to themselves, their family, and people in general. In particular, individuals infer that they themselves are at a lower risk than others (Sjoberg, 2000) because they believe that others are “worse than I am”. This egocentrism can lead individuals to overestimate the efficacy of their activities, neglecting complementary attitudes of self-protection (Weinstein, 1982). Considering food handling, a food handler with OB may neglect protective attitudes and practices related to food safety, increasing the risk of foodborne illness among consumers.

Considering inadequate handling of food is the main causal mechanism of foodborne disease (Da Cunha et al., 2014; Todd, Greig, Bartleson, & Michaels, 2007), identify the OB of food handlers will help to understand food handlers' behavior, presenting another perspective on safe food handling. Furthermore the knowledge–attitude–practice model fails to promote changes in the practices of food handlers because the model primarily relies on the provision of knowledge (Ehiri, Morris, & McEwen, 1997), so the study of other factors influencing behavior could also be used in training/intervention design (Clayton & Griffith, 2008).

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2. Methods

This study was cross-sectional and involved 176 food handlers from 119 food services of five type of food business in the city of Santos, Brazil, as follows: 29 street food kiosks, 23 beach kiosks, 28 restaurants, two hospitals and 37 school meal services.

The food services were randomly selected. Only those services that manipulated foods with a high risk of contamination, such as meat products and raw salads (Xue & Zhang, 2013), were eligible for inclusion. Only food handlers who had direct contact with food during preparation were invited to participate of the survey. The sample size was calculated using an estimate of the vector

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between the means of the OB variable obtained in the pilot study with 50 food handlers, 10 from each food business category. One point was considered as the maximum error within a 95% of global confidence interval.

OB was identified using the indirect method, in which individuals separately indicate their own risk and their peers' risk of causing a foodborne disease (Chock, 2011). The direct method tends to reveal a greater degree of OB, which may hinder the analysis of potential factors that influence this phenomenon (Helweg-Larsen & Shepperd, 2001; Miles & Scalfi, 2003).

The food handlers were asked the following questions:

- **Question 1** – “What is the consumers’ likelihood of presenting abdominal pain and/or vomiting (foodborne disease) after eating a meal or in a restaurant (other than the one where you are working)?”
- **Question 2** – “What is the consumers’ likelihood of present abdominal pain and/or vomiting (foodborne disease) after eating a meal or food prepared by you?”
- **Question 3** – “What is the consumers’ likelihood of present abdominal pain and/or vomiting (foodborne disease) after eating a meal or food in another food service that is not a restaurant (like hospitals, beach kiosks, street food kiosk or school meal services)?”
- **Question 4** – “What is the likelihood of your friends and family members present abdominal pain and/or vomiting (foodborne disease) after eating a meal or food prepared by you?”
- **Question 5** – “What is the likelihood of your friends and family members present abdominal pain and/or vomiting (foodborne disease) after eating a meal or food prepared by a food handler other than you?”

The questions were adjusted for each food business. Responses were given on a 10 cm linear scale anchored by descriptors of intensity ranging from “none” to “very high” (Da Cunha, Stedefeldt, & De Rosso, 2012; Frewer, Shepherd, & Sparks, 1994).

To assess the food handlers’ degree of OB, the score assigned to each perceived risk question was compared with the scores assigned to the other questions. Five constructs of OB were established, as follows: 1 – consumer’s risk (question 1 × question 2); 2 – friends’ and family members’ risk (question 4 × question 5); 3 – food business risk (question 1 × question 3); 4 – consumer-food business risk (question 2 × question 3); and 5 – consumer-family members’ risk (question 2 × question 4). Positive and statistically significant results indicated the presence of OB, and higher scores indicated a greater magnitude of OB (Chock, 2011; Helweg-Larsen & Shepperd, 2001).

The variables were expressed as the mean; standard deviation. To verify the existence of OB, the risk perceptions were compared with a paired t-test. To compare means among the five food business, analysis of variance with a fixed factor and Tukey’s multiple comparisons were used. For the data analysis, the software SPSS 15.0 and Statistica version 10 were used. In all tests, p < 0.05 was considered significant.

All food handlers signed a written consent form before participating in this study.

### 3. Results

A total of 176 food handlers participated in the study. The mean (standard deviation) age of the food handlers was 36.9 (11.9) years old, and the mean experience (measured in months of work as a food handler) was 101 (110) months (approximately 9.1 years). The majority (39.5%) of the food handlers had completed secondary school and were females (65.5%).

In all food businesses, food handlers perceived OB about the consumer’s risk and friends’ and family members’ risk of foodborne disease. Food handlers perceived themselves (MD = mean difference) as less likely than their peers to spread a foodborne disease to the consumer (MD = 2.75; p < 0.01) and less likely than other food handlers to transmit foodborne disease to their friends and family members (MD = 3.00; p < 0.01).

**Table 1** presents the scores for the five studied constructs of OB among food businesses. In all food businesses, OB about the consumers’ risk and friends’ and family members’ risk of foodborne disease is significantly higher in hospitals than in street and beach kiosks (p < 0.05) and higher in schools than in street kiosks (p < 0.05). In construct 5, only street food kiosks presented OB, reflecting food handlers’ belief that the likelihood of foodborne disease after eating a food or dish prepared by them is lower for the consumer than for their friends and family members.

### 4. Discussion

OB can reduce the individual’s health-protective behaviors and the individual’s precautions regarding personal risks (Mckenna, 1993; Weinstein, 1984). However, it is unlikely that OB has a negative correlation with adequate practices in food handling. Individuals with higher OB scores may be more likely to neglect protective attitudes, but this biased food handler chooses and decides to accept certain risks and avoid others. This decision may be induced by food handlers’ knowledge, experience, and other psychological characteristics, such as his and her beliefs, even if irrational. However, a study with a qualitative design can explore these aspects and help to detail the effects of OB on food handling.

<table>
<thead>
<tr>
<th>Risk assessment</th>
<th>Street food kiosks (n = 38)</th>
<th>Beach kiosks (n = 36)</th>
<th>Restaurants (n = 41)</th>
<th>Hospitals (n = 14)</th>
<th>School meal services (n = 47)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD</td>
<td>p</td>
<td>MD</td>
<td>p</td>
<td>MD</td>
<td>p</td>
</tr>
<tr>
<td>1. Optimistic bias about consumer’s risk</td>
<td>3.10</td>
<td>&lt;0.01</td>
<td>2.97</td>
<td>&lt;0.01</td>
<td>2.9</td>
</tr>
<tr>
<td>2. Optimistic bias about friends and family’s risk</td>
<td>1.60</td>
<td>0.03</td>
<td>3.42</td>
<td>&lt;0.01</td>
<td>3.49</td>
</tr>
<tr>
<td>3. Optimistic bias about risk of food businesses other than yours</td>
<td>0.13</td>
<td>0.80</td>
<td>1.21</td>
<td>0.05</td>
<td>2.4</td>
</tr>
<tr>
<td>4. Optimistic bias about other food businesses’ risk and own risk</td>
<td>3.22</td>
<td>&lt;0.01</td>
<td>4.19</td>
<td>&lt;0.01</td>
<td>5.31</td>
</tr>
<tr>
<td>5. Optimistic bias about friends’ and family’s risk compared with consumer’s risk</td>
<td>1.00</td>
<td>&lt;0.01</td>
<td>0.25</td>
<td>0.27</td>
<td>0.65</td>
</tr>
</tbody>
</table>

MD = mean difference. Bold values indicate significant differences (p < 0.05).
The presence of OB in constructs 1 and 2 indicates that this positive outlook is directed not only to the work activities, but also food and dishes prepared for friends and family. This OB can be explained by egocentrism, in which the individual has a desire to be better than others, minimizing the expertise of his peers and maximizing his own feelings of competence and self-worth (Brewer, Weinstein, Cuite, & Herrington, 2004).

Food handlers from restaurants, schools, and primarily hospitals presented OB in construct 3, believing that the food handled in other food services in the same category where they work are safer than food services in other categories. For example, food handlers from hospitals believed that food handled in hospitals is generally safer than food handled in street food kiosks, beach kiosks, restaurants, and schools. This result is most likely derived from a comparison to a high-risk stereotype. Using this high-risk stereotype as a standard makes the individual misjudge his own risk (Weinstein, 1980; Weinstein, 1989); in the current case, the individual misjudges the risks inherent to food services. In food handling, the high-risk stereotype includes street food kiosks, beach kiosks, and other food businesses that are established in open areas, most likely because they lack of control of the water supply, exclusive toilets for the food handlers and the presence of pests and animals, among others (Rane, 2011). Even food handlers in these food businesses considered themselves and their peers to have the same or a higher risk of being responsible for the spread of foodborne disease compared with other food businesses because they did not present OB in construct 3. This finding can be confirmed when construct 4 is analyzed. In all food businesses, food handlers perceived themselves as less likely to cause a foodborne disease than food handlers in other categories of food businesses. This OB was higher in hospitals and schools compared with street food kiosks. Food handlers in restaurants, schools, and hospitals not only have more confidence in their work but also rely more on their peers and similar food services.

In this context, the environment can empower the food handler and evoke a positive outlook regarding risks. Hospitals and schools generally have a supervisor with higher education, frequent training about food handling, and more adequate structures/buildings compared with other businesses (Baş, Ersun, & Kıvanç, 2006). These characteristics can give confidence (or overconfidence) to the present OB regarding the risk of being responsible for handling foods that can spread foodborne disease to consumers, friends, and family members and even an OB when compared their category of food business with others. The food handler believes that other food handlers are worse than he or she is. Environmental characteristics can empower food handlers and increase their OB, as observed among schools’ and hospitals’ food handlers.

The study of the OB of food handlers in relation to foodborne disease can help to clarify why even with the improvement of technology, education techniques, and certification and intervention programs, the number of cases of outbreaks is not decreasing. Many studies on food handlers’ practices can be found in scientific databases, but few of these studies are dedicated to understand the food handler’s behavior and perceptions. If the food handler is the most responsible for these outbreaks, understand his or her behavior, feelings, and perceptions can enable the elaboration and discussion of different strategies of training and education.

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References


