Perceptions of 'invulnerability', 'optimistic bias', 'illusion of control', and 'superiority bias'



regarding food safety risks among Lebanese consumers
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Introduction

Consumer attitudes, knowledge, and practices regarding food safety in the Middle East and North Africa (MENA region) including Lebanon are understudied [1]. In recent years, a small number of food safety research studies have been conducted with Lebanese consumers. Findings suggest that:

- Low awareness of food safety among Lebanese students contributed to higher consumption of risk associated food products and thus, increased the risk of food
- Food safety knowledge and practices among consumers in Lebanese households are low [3].
- The majority of domestic refrigerators in Lebanon are operating at temperatures exceeding recommended refrigeration temperature of 5°C [4].

Cumulatively, these food safety studies with Lebanese consumers have identified the need for food safety education interventions to reduce the risk of foodborne illness.

However, to facilitate the development of effective, targeted consumer food safety education, there is a need to identify, consider, and address perceptions regarding food safety risk, control, responsibility, and hygiene consciousness that may undermine food safety education attempts [5].

Despite a number of consumer food safety research studies involving consumers from Lebanon [1-4], none have conducted a quantitative analysis to explore the perceptions of risk, control, responsibility, and hygiene consciousness of consumers regarding food safety in the region.

Purpose

The aim of this study was to obtain quantitative data from Lebanese consumers regarding their perceptions of personal levels of food safety risk, control, responsibility, and hygiene consciousness.

Methods

Data capture tool: A paper-based self-complete questionnaire was developed. Perceptions of risk, control, responsibility, and hygiene consciousness for food safety were determined using a ten-point variation of a visual analogue scale. This scale has been utilised in previous research [5-8].

Recruitment: Consumers (aged ≥18 years) who visited a 'Health Day' information stall organised by the Modern University for Business and Science, at a shopping mall in Beirut, Lebanon were invited to participate in the study.

Data collection: Consumers that indicated a desire to participate in the study were provided with the paper-based questionnaire and pen. Completed return implied consent to participate. Capture data were entered into an electronic database.

Data analysis: Descriptive statistics were conducted using Microsoft Excel 2016. Inferential statistics were conducted using SPSS Statistics for Windows, Version 26 to determine statistically significant differences or associations.

Ethical Approval: Ethical approval was obtained from the Cardiff School of Sport and Health Sciences, Healthcare and Food Research and Ethics Committee at Cardiff Metropolitan University (Ethics reference: 9298) and the Ethics panel at the Modern University for Business and Science, Lebanon (Ethics reference: MU-20171104-1).

Results

Perceptions of food safety risk, control, responsibility and hygiene consciousness

A total of 95 Lebanese consumers participated in the study, 45% were female, and 31% did not disclose their gender. The study included participants aged 18 – 79 years of age, the majority were aged 18 – 29 years (41%) and 30 – 39 years (58%) reported preparing meals from raw ingredients in their kitchen on a weekly basis or more often. Forty percent reported that they had experienced foodborne illness in the last five years.

Perceived risk of foodborne illness.

Risk perceptions relate to the likelihood, susceptibility and severity of a risk occurring [9]. As indicated in Table 1, consumers from Lebanon perceived themselves to have a low risk of acquiring a foodborne illness:

- Perception of personal risk of foodborne illness was considered to be 'low very low' by 49% of consumers.
- Only 19% believed 'others' to have a comparable low risk of foodborne illness.
- Statistical analysis determined that participants perceived 'themselves' to have a significantly lower risk of foodborne illness compared to 'other people' (p

Underestimating the potential risk to 'self', is known as 'optimistic bias' [10]. This underestimation of personal risk can result in the 'perception of invulnerability' where the risk is expected to occur among others as opposed to themselves [11].

Perceived control for food safety.

The perception of control is an individual's perceived ability to control an outcome as a direct result of their own behaviour [12-14] This study has determined that consumers in Lebanon perceived themselves to have high levels of control for foodborne illness indicating confidence in their food safety behaviours:

- 60% perceived themselves to have 'high very high' levels of control.
- 21% perceived 'others' to have the same level of control as themselves.
- Participants perceived 'themselves' to have significantly greater levels of control for food safety than 'other people' (p < .001, Table 1).

Findings from this study suggest that consumers in Lebanon may overestimate their own ability to control food safety. Such overestimation is known as 'the illusion of control' [15,16].

Perceived responsibility for food safety.

Perceived responsibility may impact behavioural reactions [17]. Perceiving a sense of personal responsibility, may implement desirable behaviours [18]. Table 1 illustrates that high levels of responsibility were perceived among participants:

- 54% perceived themselves as having 'high very high' levels of responsibility for ensuring food safety.
- 24% perceived 'others' to have the same level of responsibility as themselves.
- Personal responsibility for food safety was perceived to be significantly greater for 'self' than for 'others' (p < .001).

The pervasive tendency of an individual to perceive themselves in a favourable way and overestimated their own qualities is acknowledged as a form of selfenhancement and superiority bias that occurs in social comparison [19].

Perceptions of hygiene consciousness.

High levels of hygiene consciousness were perceived among consumers from Lebanon that participated in this study.

- 60% perceived themselves as being 'very conscious' of food safety (Table 1).
- 28% believed 'others' to have the same level of hygiene consciousness as
- Hygiene consciousness was perceived to be significantly greater for 'self' compared to 'others' (p < .001).

Perceiving greater levels of consciousness and awareness may be attributable to factors such as superiority bias that occurs in social comparison [19] or social desirability bias, where there is a tendency for an individual to present a favourable image of themselves [20].

TABLE 1: Perceptions of risk, control, responsibility, and hygiene consciousness for 'self' and 'others' with significant differences determined using the Wilcoxon Signed Rank Test.

Perceptions	For 'Self'						For 'Others'						Significant differences.	
	n	Responses		Mean	SD	Median	n	Responses		Mean	SD	Median	(Statistical analysis using the Wilcoxon Signed Rank Test)	
		1-3	8-10	IVICALI		IVICUIAIT	riculaii 11	1-3	8-10	IVICALI	SD	Median	Marik Test)	
Perceived risk of food poisoning (1 = very high risk – 10 = very low risk)	95	23%	49%	6.4	3.2	7	95	20%	19%	5.9	2.4	6	Z = -3.152, $p = .002$, $r = 0.23$	
Perceived control of food safety (1 =no control – 10 = total control)	93	19%	60%	6.9	3.0	8	93	15%	21%	6.0	2.3	6	Z = -4.040, p < .001, r = 0.30	
Perceived responsibility for food safety (1 = no responsibility – 10 = complete responsibility)	94	19%	54%	6.8	3.2	8	91	12%	24%	6.2	2.4	7	Z = -4.202, p < .001, r = 0.31	
Perceived level of hygiene consciousness (1 = not at all conscious – 10 = very conscious)	94	20%	60%	6.9	3.2	9	90	17%	28%	6.1	2.5	7	<i>Z</i> = -3.686, <i>p</i> < .001, <i>r</i> =0.27	

Significant relationships between perceptions

The relationship between perceived risk, control, responsibility, and hygiene consciousness was investigated using the Spearman rank order correlation. As illustrated in Table 2, the statistical analyses identified that there were strong positive correlations (r = .50 to 1.0) between each of the variables (p < .001).

Findings indicate that low levels of perceived risk were associated with high levels of perceived control, high levels of responsibility and high levels of hygiene consciousness; whereas high levels of perceived risk were associated with low levels of perceived control, low levels of responsibility and low levels of hygiene

TABLE 2: Correlations between perceptions of risk, control, responsibility, and hygiene consciousness determined using the Spearman rank order correlation.

	Perceived risk of foodborne illness	Perceived control of food safety	Perceived responsibility for food safety	Perceived hygiene consciousness
Perceived risk of foodborne illness	N/A	<i>r</i> =.831, <i>n</i> = 93, <i>p</i> < .001	<i>r</i> = .799, <i>n</i> = 94, <i>p</i> < .001	<i>r</i> = .777, <i>n</i> = 94, <i>p</i> < .001
Perceived control of food safety	<i>r</i> =.831, <i>n</i> = 93, <i>p</i> < .001	N/A	<i>r</i> = .759, <i>n</i> = 92, <i>p</i> < .001	<i>r</i> = .758, <i>n</i> = 92, <i>p</i> < .001
Perceived responsibility for food safety	<i>r</i> =.799, <i>n</i> = 94, <i>p</i> < .001	<i>r</i> =.759, <i>n</i> = 92, <i>p</i> < .001	N/A	<i>r</i> =.851, <i>n</i> = 94, <i>p</i> < .001
Perceived hygiene consciousness	<i>r</i> =.777, <i>n</i> = 94, <i>p</i> < .001	<i>r</i> =.758, <i>n</i> = 92, <i>p</i> < .001	r = .851, n = 94, p < .001	N/A

Impact of foodborne illness on perceptions

As indicated in Table 3, this study established that significant differences were determined in perceptions according to reported foodborne illness experiences (p < .05).

Those who reported having experienced foodborne illness perceived themselves to be at significantly greater risk of foodborne illness, with lower levels of control and responsibility for food safety, and lower levels of hygiene consciousness.

TABLE 3: Perceptions of risk, control, responsibility, and hygiene consciousness according to those who reported having had and not having had experiences foodborne illness during the last five years, with significant differences determined using the Mann-Whitney U Test.

		odbo	rne illr	ness	No	foodk	orne i	Significant	
Perceptions	n	Responses		Mean	n	Responses			Mean
		1-3	8-10			1-3	8-10	IVICALI	differences
Perceived risk of food poisoning (1=very high risk – 10=very low risk)	57	33%	39%	5.6	38	8%	66%	7.6	<i>U</i> = 692, <i>z</i> = -3.015, <i>p</i> = .003 <i>r</i> = .31
Perceived control of food safety (1=no control – 10=total control)	55	29%	53%	6.1	38	5%	71%	8.0	<i>U</i> = 696, <i>z</i> = - 2.771, <i>p</i> = .006 <i>r</i> = .29
Perceived responsibility for food safety (1=no responsibility – 10=complete responsibility)	56	29%	48%	6.2	38	8%	71%	7.8	<i>U</i> = 781.5, z = 2.211, p = .027 r = .23
Perceived hygiene consciousness (1=not at all conscious – 10=very conscious)	56	30%	52%	6.2	38	5%	71%	8.0	<i>U</i> = 743.5, <i>z</i> = 2.520, <i>p</i> = .012 <i>r</i> = .26

Significance of study

- The perceptions and biases identified among Lebanese consumers in this study are of great importance to help inform the development of future consumer food safety education interventions as such perceptions and experiences may undermine food safety education attempts.
- Before the findings of this study can be utilised to inform intervention development, there is a need to establish the learning preferences of consumers in Lebanon through the process of co-creation.
- The most notable finding in this study is that negative food safety experiences, such as acquiring a foodborne illness can have a negative impact upon perceptions of risk, control, and responsibility to prevent reoccurrence of foodborne illness.

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References

- Chalak, A. & M. Abiad (2012) How effective is information provision in shaping food safety related purchasing decisions? Evidence from a choice experiment in Lebanon. *Food Qual. Pref.*, **26**(1): p. 81-92. Hassan, H.F. & H. Dimassi (2014) Food safety and handling knowledge and practices of Lebanese university
- students. *Food Control*, **40**: p. 127-133.

 Hassan, H.F., *et al.*, (2018) Self-reported food safety knowledge and practices of Lebanese food handlers in Lebanese households. *Brit. Food J.*, **120**(3): p. 518-530.
- L. Hassan, H.F., et al., (2015) Survey and analysis of internal temperatures of Lebanese domestic refrigerators. Int. J.
- Evans, E.W. & E.C. Redmond (2019) Older Adult Consumers' Attitudes and Perceptions of Risk, Control, and Responsibility for Food Safety in the Domestic Kitchen. *J. Food Prot.* **82**(3): p. 371-378.
- 6. Redmond, E.C. & C.J. Griffith, (2004) Consumer perceptions of food safety risk, control and responsibility.
- Evans, E.W. & E.C. Redmond, (in press) Perceptions of Food Safety Risks, Control and Responsibility Amongst Patients and Family-Caregivers During Chemotherapy Treatment. Food Safety Manag. Pract.,
 Evans, E.W., et al., (2021) Exploring Listeria monocytogenes perceptions in small and medium sized food manufacturers: Technical leaders' perceptions of risk, control and responsibility. Food Control, 126: p. 108078.
- Brewer, N., *et al.,* (2007) Meta-analysis of the relationship between risk perception and health behavior: the example of vaccination. *Health Psychol.,* **26**(2): p. 136 145.

 0. Weinstein, N., (1989) Optimistic Biases about Personal Risks. *Science,* **246**(4935): p. 1232 1233.
- 1. Rutter, D. and L. Quine, (2002) Changing health behaviour intervention and research with social cognition models.
- Byrd-Bredbenner, C., et al., (2007) Food Safety Self-Reported Behaviors and Cognitions of Young Adults: Results of a National Study. J. Food Prot., 70(8): p. 1917-1926.
 Lifshitz, M.N., (1966) Internal-external Locus of Control and Negotiation Behavior. Ohio State University.
 Bennett, P., (2000) Introduction to clinical health psychology. Open University Press.

- 15. Langer, E.J., (1975) The illusion of control. *J. Pers. Soc. Psychol.*, **32**(2): p. 311-328.

 16. Thompson, S.C., (1999) Illusions of Control:How We Overestimate Our Personal Influence. **8**(6): p. 187-190.

 17. Weiner, B., (1995) *Judgments of Responsibility: A Foundation for a Theory of Social Conduct*. Guilford Pub

 18. Brown, R.C.H., (2013) Moral responsibility for (un)healthy behaviour. *J. Med. Ethics*,

 19. Hoorens, V., (1993) Self-enhancement and Superiority Biases in Social Comparison. *Eur. Rev. Soc. Psychol.*, **4**(1):
- 20. Grimm, P., (2010) Social desirability bias, in Wiley International Encyclopedia of Marketing. Wiley.

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