



Investigating a link of two different types of food business management to the food safety knowledge, attitudes and practices of food handlers in Beirut, Lebanon



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ABSTRACT

Although Lebanon has a flourishing traditional and modern food businesses, which are typical both Middle Eastern (ME) and Mediterranean cuisines, knowledge and practice of food safety performance of the food service sector are limited in the whole ME region and lacking in Lebanon. To address this, a survey was conducted in Beirut to evaluate the knowledge, attitudes and practices related to food safety issues of food handlers ($n=80$) in food service establishments ($n=50$) and to assess the influence of management type on enactment of safe practices on food premises. Our data suggest that while respondents have limited knowledge of some aspects of food safety, substantial gaps in their knowledge and self-reported practices associated with critical temperature of foods and cross contamination remain, therefore posing health risks to consumer health. Food handlers in corporatemanaged food outlets showed a significantly higher awareness on food safe practices. It is concluded that the management type is an integral element of TPB (Theory of Planned Behaviour) that influence food handlers' practices and substantiate the need for more research work on safe food handling in the context of food safety culture framework in food businesses. Our data revealed the critical need for food safety education interventions and technical guidance fostered by synergistic participation of the private and public sector to support food handlers in SME's (small and medium sized enterprises).

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1. Introduction

Despite the numerous scientific research and the international authorities' endeavours towards the development of control measures and food safety interventions, food safety remains a global complex public health issue and incidences of food borne diseases persist worldwide.

Data on risk factors for food poisoning outbreaks imply that most incidences result from improper food handling practices in foodservice outlets and homes (Howes, McEwen, Griffiths, & Harris, 1996) and that contaminated hand contacts during preparation of food are probably the common reason of food handlers' implication in most cases. This is often attributed to employees' lack of

knowledge (Greig, Todd, Bartleson, & Michaels, 2007) and to the poor understanding of food management systems which act as principal barriers against the implementation of basic food safety measures in small and medium-sized foodservice companies (SMEs) (Ehiri & Morris, 1996; Fielding, Ellis, Beveridge, & Peters, 2005).

The provision of food safety and hygiene training and the effective enactment of safe food handling practices are vital to controlling food-borne illnesses. Better food safety information through training and education of food workers, including their certification, has been shown to improve their food handling practices and reduce food contamination during preparation (Hislop & Shaw, 2009; Lynch, Elledge, Griffith, & Boatright, 2003; McIntyre, Vallaster, Wilcott, Henderson, & Kosatsky, 2013); Yet, training alone was not proven the only variable correlated with safe and proper practices on food premises. Knowledge plays an essential role in the enhancement of behaviours and practices, but it is not the only factor that would lead to proper food handling and

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needs to be complemented with other elements (Seaman & Eves, 2008).

A number of studies used the social cognitive theories to complement the findings on what impedes proper food handling. The Theory of Planned Behaviour (TPB) has been advocated by many researchers to predict determinants of food handler's behaviour (Mullan & Wong, 2010; Seaman & Eves, 2010).

According to the TPB, the performance of behaviour is determined by different motivational factors which work together to influence individuals' behavioural intention (Ajzen, 1991), they include attitude, subjective norm (the pressure perceived about whether or not to perform the behaviour as established by social group identity), and perceived behavioural control (perceived availability of opportunities and resources required to perform the behaviour contributing to the perceived ease or difficulty in its performance). Various studies assessed food handlers' knowledge and attitudes. Whilst several citations assessed the level of knowledge of food handlers on food safety and its influence on attitudes and practices (Abdul-Mutalib et al., 2012; Abdullah Sani & Siow, 2014; Baş, Şafak Ersun, & Kivanç, 2006; Jevšnik, Hlebec, & Raspor, 2008; Karaman, 2012; Osaili et al., 2013), It was shown that perceived behavioural control (PBC) was the most significant predictor of safe food handling intention suggesting that food safety practices are not wholly within food handlers' own control (Mullan & Wong, 2009).

In Lebanon, as in many developing countries, the food safety regulatory framework through the food supply chain is not effectively developed. One reason for this is the antiquated laws responsible for food safety that are not consistent with the international approach that adopts hazard-based and risk-based systems, and overlapping responsibilities of governmental departments and agencies (UNIDO, 2002). This leads to an inadequate enforcement of food law on premises through lack of specific regulations and a limited role for inspections. To date, there is no information on the food safety performance of the food service sector in Lebanon; particularly on the small and medium-sized foodservice establishments which share common challenges, such as the lack of resources (time, labour and financial) and lack of technical expertise (WHO, 1999). Furthermore, there have not been significant contributions of scientific studies on investigating the relation of food businesses management with food handlers' attitudes and behaviour towards food safety.

In this study, we aimed to evaluate the level of knowledge, attitudes and practices in food safety of food handlers in SME's in Beirut, Lebanon, and to assess the influential role of two different types of management (developed corporate owned food businesses and less-developed sole proprietor owned food businesses) as a food safety culture element on their perceptions and safe practices.

2. Materials and methods

2.1. Sample selection

There are no official data on the overall number of operating food businesses in Beirut. Many small food businesses are operating without a license of registration as reported by a member in the Ministry of Tourism (MoT) and a warning issued by the Prime Minister's office in Beirut (El Amin, 2013). Therefore, a list of 150 foodservice establishments registered in the Lebanese Syndicate of Restaurants owners and the MoT, was formed. The selection of restaurants was based on:

- High business turnover,
- Type of management i.e. local food outlets owned by developed corporations and by less developed sole proprietor or traditional popular food outlets.

The international fast food chains and restaurants and supermarkets were not included in this study.

Restaurants owners/managers were approached by phone to introduce the research objectives and to arrange for an appointment for entry permit to food premises. Out of 150 listed food businesses, 50 restaurants, which represented a geographical portion in Beirut and are typical foodservice outlets in Lebanon and in many countries of the Middle East, agreed to take part in the survey. A greater percentage of the participating foodservice establishments (70%) were of micro sized businesses employing less than 10 food handlers, 22% were small sized with 10–15 food handlers, and 8% were medium sized food businesses. The survey, including follow up calls and meetings with owners/managers, was carried out over a period of 4 months.

In our study, the term “food handlers” refers to executive chefs, chefs, assistant chefs, owners involved in different functions of food handling i.e. receiving, storing, preparing and cooking food.

2.2. Development of the questionnaire

A questionnaire consisting of four sections was designed to be administered in a face-to-face interview with food handlers ($n = 80$) to ensure the accuracy of respondents' answers and to avoid external influences. A separate letter of consent for owners and for participant was read explaining the objectives of the research were dually signed by researcher and participants.

- Section one: this was designed to obtain demographic information and each food handler's profile such as gender, age, education, working experience, food safety training course attendance.
- Section two: this contained 16 multiple-choice questions (each with four or five possible answers), three closed questions and one open question to assess food handlers' knowledge on food poisoning, cross contamination prevention, temperature control, personal hygiene, and sanitation. In order to avoid chances that food handlers select correct answers and any answer by chance, the multiple choice answers included “I do not know”. The questions were based on the content of a basic level training courses in food safety and adapted from the work of Tokuç et al. (2009) and Walker, Pritchard, and Forsythe (2003) with some modifications.

Section three: this aimed at understanding food handlers' attitudes on a *Likert-type Scale* that indicates the degree of agreement of respondents to 16 statements on food safety using a three-point rating scale (disagree = 1, uncertain = 2, agree = 3). The score ranged between 0 and 48. The sum of scores was converted to 100 points.

Section four: this demonstrated the frequency of safe handling practices. It included 19 questions on sources of personal hygiene, and temperature control, cross contamination prevention, cleaning, storage and display of food on a five points rating scale (never = 1, rarely = 2, sometime = 3, often = 4 and always = 5). The score range was standardised between 0 and 100.

The attitudes and practices questionnaires were adapted from the work of Angelillo, Viggiani, Greco, and Rito (2001) with some modifications.

- The business size: micro-small; small; medium
- Types of food served, e.g., raw vegetables salads in addition to other varieties of hot and cold ready to eat foods,

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