

## Chapter 7

# A Systematic Literature Review of Assessing the Level of Food Safety Knowledge Among Food Handlers in Malaysia

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### ABSTRACT

*Being knowledgeable about food safety is one of the strategies to address food-borne diseases (FBD). The systematic review was focuses on food safety knowledge and the respective interventions. Generally, numerous relevant studies have been done to determine the level of food safety knowledge among food handlers, but studies from a Malaysian perspective were limited. Therefore, the present study reviewed a number of previous studies regarding level of food safety knowledge and type of interventions that have been done among various categories of food handlers in Malaysia. For the review purpose, preferred reporting items for systematic reviews and meta-analyses (PRISMA) was adopted based on Science Direct, Scopus, and Google Scholar databases. A total of 22 resulted from the searching and were analyzed systematically. The review of food safety knowledge was divided into three themes consisting of food handlers at premises, consumers, and students. The results of this review have identified the knowledge gap of food handlers, and the authors provide recommendations for future food safety education.*

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## INTRODUCTION

The food and waterborne diseases in Malaysia include cholera, dysentery, food poisoning, Hepatitis A, and typhoid (Ministry of Health Malaysia, 2017). Recently, several cases of food poisoning and even some deaths have been reported. For example, Malaysia was shocked by food poisoning because consuming “*Laksa*” contributed to 34 cases, including two deaths in Perak, 25 cases in Kedah, and 24 cases in Selangor (The Malaysian National News Agency, 2018). In addition, 36 students from *tahfiz* center in Kedah (Noorazura Abdul Rahman, 2019), 49 primary school students in Keramat (New Straits Times, 2019), and 110 college students in Kajang (The Malaysian National News Agency, 2019) was rushed to hospital after experiencing symptoms such as vomiting, stomach ache, and diarrhea. All of them have been confirmed suffering from food poisoning. A recent case of food poisoning was reported at the training center in Kuala Lumpur involving a total of 137 kindergarten teachers after consuming “*ayam masak lemak*” dish (The Malaysian National News Agency, 2020).

Clinical reports of Malaysian diarrheal patients revealed that non-typhoid *Salmonella* (57%) become among the most significant pathogens isolated from their stool samples, followed by enteropathogenic *Escherichia coli* (14%), *Shigella* (11%), *Campylobacter* (5%), and *Aeromonas* (5%) (Dewanti-Hariyadi & Gitaprawati, 2014). All of these pathogens can be found in common foods, for example, *Salmonella* discovered in meat, especially buffalo (Saira Banu, Humairak, Zakiah, & Siti Adila, 2019), or leafy vegetables such as cabbages and cucumbers (Saw et al., 2020).

Poor personal hygiene among food handlers was also a significant cause for the transmission of the pathogen into food. A microbiological study by Nasrolahei, Mirshafiee, Kholdi, Salehian, & Nasrolahei (2017) revealed that *Staphylococcus aureus* and *Escherichia coli* were prevalent in the fingernails of butchers, fast food handlers, and school cafeterias staff. Furthermore, during the typhoid outbreaks in Kelantan, Malaysia, food handlers also identified as the chronic carriers for *Salmonella* Typhi that were detected from their stool samples (Chua et al., 2015).

Pathogens transferred from the unhygienic hands of food handlers may continue to survive in food that is not stored and cooked at a recommended temperature. In the case of consuming raw or uncooked eggs that lead to the infection of *Salmonella enterica*, it could be prevented by immersed the half-boiled egg in freshly boiled water for at least 15 min (Mohamad Fithri et al., 2018). Regarding this matter, food handlers also recommended cooking the egg at a temperature more than 100 °C for 8 min and low storage temperature in the refrigerator to be practiced at home and other food premises to minimize the risk of food poisoning caused by *Staphylococcus* (Sánchez, Neira, Laca, Laca, & Díaz, 2019). Therefore, to ensure that food is safe to consume, the food handlers should adopt food safety practices. Numerous studies

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