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Article

Revelation of Children and Adult's Food Allergen in Malaysia

Norrina Din[1], Basri Rashid[2], Kamal Izzuwan Ramli[3], Nur Aliah Mansor[4] and Dahlan Abdullah[5]

[1,5]Faculty of Hotel and Tourism Management, UniversitiTeknologi MARA Penang Branch; norrina.din@uitmppinang.edu.my,dahla707@ppinang.uitm.edu.my.
[2,3] School of Tourism, Hospitality and Event Management, College of Law, Government and International Studies, Universiti Utara Malaysia; basri@uum.edu.my,izzuwan@uum.edu.my
[4]Faculty of Hospitality, Tourism and Wellness, Universiti Malaysia Kelantan; aliah.m@umk.edu.my

* Correspondence: norrina.din@uitmppinang.edu.my: Tel +6043823677
† These authors contributed equally to this work

Abstract: Food allergy has been recognised by the World Health Organisation as a chronic disease that could lead to fatality. The symptoms can mediate from mild to severe consequences. Some cases have reported that food allergy sufferers are bullied and are discriminated at workplace, thus increasing their stress level, apart from facing difficulty in consuming certain food due to allergy. This has an adverse effect on the quality of life amongst food allergy sufferers. Medical bills are increased when food allergy sufferers become unknowingly exposed to food allergen. Hence, this study investigated food allergens among food allergy sufferers in order to make their lives better. A total of 250 respondents participated in an online survey. Surprisingly, apart from chicken, soybean and other food allergens that have been listed under the Big Eight Allergens, the respondents mentioned some fruits that could trigger allergic reactions, such as rambutans and watermelons. Food allergy sufferers can be allergic to seafood and seafood products as well, such as shrimp paste or locally known as *belacan*, which refers to fermented shrimp paste cured under the sun. It is a common food ingredient used among Malaysians. The study findings offer practical insights, such as avoidance of food allergens amidst food allergy sufferers and help the government to carefully manage for menu planning. The knowledge contribution of this study reveals several specific food and fruits, as aforementioned, which appear to be common and nutritious food, yet harmful to food allergy sufferers.

Keywords: food allergy, food allergen, fruits, seafood, nut and milk

1. Introduction

Food allergy refers to the opposing reaction to food allergen. Food allergy reactions can be mild, severe, or even lead to fatal consequences [1], hence an important area of study. This is the reason on why food allergy has been listed by the World Health Organisation as a chronic disease [2]. Despite the chronic nature of this disease, people tend to ignore the severity of food allergy due to limited knowledge pertaining to food allergy [3,4]. Awareness seems to be given more focus on cardiovascular diseases and cancer, while omitting food allergy [2]. Interestingly, more people are affected by food allergy than the mentioned diseases being given focus.

The prevalence of food allergy among people worldwide cannot be denied. The number of global population affected by food allergy had been estimated to be 220-250 million people [2]. In Europe, the number stood at 11-26 million, while in Malaysia, the percentage escalated up to 10-15% amongst the children population [2]. Some 877 severe food allergy sufferers were reported in Norway and this population has kept increasing [5]. The United States reported a 10% increase in food allergy population [6], while in the United Kingdom, 1-2% of adults were affected by food allergy and 5-8% amidst the children population [7]. In Taiwan, about 2,108 people out of 30,018 were estimated to be food allergy sufferers [8]. To date in Japan, about 45,807 children were affected

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by food allergy and 3,499 experienced food allergy reactions [4]. As aforementioned, the population of food allergy sufferers seems to be increasing in many parts of the world.

Food allergy can affect many people at any stage in their lives. It could be anywhere between infancy and adulthood [9]. Food restriction is one of the many methods to avoid food allergy by sufferers from allergic reactions [10]. Some symptoms of food allergy include swelling in the face regions (e.g. lips, tongue, and throat), difficulty in breathing, stomach cramps, diarrhoea, and vomiting [2]. The symptoms of food allergic reactions appear immediately and the victims are bound to suffer from food allergy [11]. All the symptoms tend to increase the level of anxiety, absenteeism from work or school by parents and food-allergic children [12], bully [13], and face discrimination at workplace [14]. All these consequences incur medical costs and can lead to low quality of life [15].

More than 170 food allergens have been identified [16]. In the Asia Pacific, foods that are known to cause allergies that should be avoided are shellfish because they could trigger anaphylactic shock that may be fatal. Shellfish has been identified as the top ranking food allergen [17]. Food allergens classified in the Big Eight Allergens are eggs, cow's milk, fish, shellfish, peanuts, tree nuts, wheat, soya [18], sesame seeds [16], birds nest [19,21], cheese, beef, chocolate [20], ham, duck, chicken, and some fruits [21], namely rambutans, banana, watermelons, apples, oranges, kiwis, and strawberries [22]. Besides fruits, one of the most common ingredients used in Malaysian cooking, which is *'belacan'* or shrimp paste, a seafood product [23], appears to be a type of food allergen as well.

The three major ethnic groups in Malaysia are Malays, Chinese, and Indians, along with other minor ethnic groups. These ethnic groups differ in various respects, namely food habits, practices, and food restrictions [24]. Previous studies have identified that food allergens among the Malaysian population include crab, prawn, squid, cockle, mackerel, anchovy, milk, egg, soy, wheat, rice [25], mutton, beef, chicken, and banana [26]. The skin prick test verified that rice and shrimp were found to cause allergic reactions amongst food allergy sufferers. This study was conducted to further investigate the food allergens among food allergy sufferers, both adults and children which is not previously integrated examined by other researchers.

2. Methods

An online survey was distributed to the respondents who worked in the nursery. Out of 600 of the total population, only 250 responded. The sample population were nursery employees. The reason for choosing the sample was because more working women in the workforce require them to send their children to care centres for early education. Children are easily affected by food allergies, thus demand special attention. Consent was obtained from the nursery authorities. A pilot study was conducted among 30 respondents, which were excluded from the sample size. Open-ended questions were embedded to gather information pertaining to food allergens for both groups - nursery adult employees and children at the nursery. The Malay language was used in the survey as it is the national language and officially used in Malaysia. The survey was divided into several parts; Part A dealt with the demographic profile, and Part B was about food that they were allergic to. Open-ended questions were included to gain information about food allergies from the respondents. The results were analysed descriptively using Statistical Analysis for Social Science (SPSS) version 22 software program. The study outcomes are tabulated in Tables 1, 2, and 3.

3. Results and Discussion

The respondents were females, similar to the study conducted by [27], which investigated the management of food allergy among nannies. Turning to this study, the respondents were confined to the Malays. The summary of the demographic profile is depicted in Table 1.

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Table 1. Summary of the Demographic profile (n=250)

Demographic Profile	Frequency (%)
Gender	
Female	250 (100)
Race	
Malay	250 (100)
Age	
18-25	23(9.2)
26-35	93(37.2)
36-45	58(23.2)
46-55	62(24.8)
55 and above	14(5.6)
Working experience	
6 months and below	28 (11.2)
1-2 years	18 (7.2)
3-4 years	18 (7.2)
5 years and above	186 (74.4)

3.1 Food allergens among children

The most significant information retrieved in this study is food allergen. The abundance of food makes food allergy sufferers, who are mainly children and their parents, to carefully check and select suitable food prior to consumption. The respondents (nursery employees) were required to report the food allergens of their students and the results are given in Table 2. 20.8% of the respondents reported that the food allergy sufferers were allergic to seafood [28], such as prawn, squid, crab, cockles, and oyster [29]. In Malawi and in Malaysia, seafood seems to be the major contributor that can trigger allergic reactions among food allergy sufferers [26,29]. Another 12% of the respondents reported that the food allergy sufferers were allergic to nuts. Nuts are identified as a higher contribution for the food allergy reaction in the United Kingdom [30].

A total of 8.8% of the respondents reported that the food allergy sufferers were allergic to seafood and nuts, while 2% of the respondents said that the food allergy sufferers were allergic to multiple food allergens, such as seafood, nuts, eggs, and fruits. Another 1% of the respondents informed that the food allergy sufferers were allergic to chicken, meat, and 1% of them also reported to have multiple food allergens like meat and milk, nut and eggs, nut and meat, seafood and egg, seafood, nut and egg, seafood, nut and fruits. Meanwhile 1% reported that the have the combination of food allergens such as seafood, chicken, egg and meat. Nonetheless, only 0.8% of the respondents informed that the food allergens of their students were eggs, seafood, milk, chicken, and soybean, similar with previous studies [26]. Additionally, fruits, such as watermelons and rambutans, were reported to cause allergies in this study, which appear to be in line with prior studies [26,30]. The minority of the food allergy sufferers were allergic to meat, milk, nuts, eggs, seafood, and chicken, as reported by 0.4% of the respondents. This included ingredients, such as milk, which are used in making other foods (e.g. cakes, butter, and cheese) [27]. The results revealed that the food allergy sufferers were allergic not only to the one food allergen, but also to multiple food allergens [3]. This means; extra precaution must be taken to avoid such food and the ingredients that go into other food types as well [29].

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Table 2 Food allergens among children (n=250)

Food allergen	Frequency (%)
Chicken	3 (1.2)
Egg	2 (0.8)
Meat	1(0.4)
Meat and milk	1(0.4)
Nut	30 (12)
Nut & egg	1(0.4)
Nut & meat	1(0.4)
Nut & milk	3 (1.2)
Seafood	52 (20.8)
Seafood & chicken	2(0.8)
Seafood & egg	3 (1.2)
Seafood & meat	1(0.4)
Seafood & milk	2 (0.8)
Seafood & nut	22 (8.8)
Seafood, nut & egg	4 (1.6)
Seafood, nut & fruits	4 (1.6)
Seafood, chicken, egg & meat	1(0.4)
Soybean	2(0.8)
Watermelon &Rambutan	2(0.8)
Total	250

3.2 Food allergen among adults

Nursery employees were required to report on the food that they were allergic to as well. As a result, 86.6% of the respondents claimed that they had no food allergy, whereas 10% of them were allergic to seafood and seafood products, such as prawns, squid, crab, cockles and anchovies [26,29,31]. The respondents were not only allergic to seafood, but also to the by-products of seafood, such as shrimp paste (*belacan*), *cencalok*, and fermented anchovies (*budu*). '*Belacan'* or shrimp paste is a common food ingredient consumed daily in the Northern part of Malaysia, while '*cencalok*' and '*budu' are* usually consumed in the East Coast of Malaysia. '*Belacan' is* usually used to make chili gravy or '*sambal'*, a thick curry paste to be served with popular dishes of Malaysia, namely *Nasi Lemak*. The condiments for *Nasi Lemak*, such as peanuts and anchovies, are also classified under the Big Eight Allergen food group. Only 2% of the respondents reported that they were allergic to nuts. A very small percentage, 0.4% of the respondents, reported to be allergic to chicken, seafood, and nuts. All information pertaining to the nursery employees is summarised in Table 3. The results from this survey signify that most of the food allergy sufferers are allergic to similar food reported from across the globe [29].

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Table 3 Food allergen among adults (n=250)

Food allergen	Frequency (%)
No	217 (86.6)
Chicken	1 (0.4)
Nut	5 (2.0)
Seafood and seafood products	25 (10.0)
Seafood & chicken	1 (0.4)
Seafood & Nut	1(0.4)
Total	250

4. Conclusions

In conclusion, it is important to investigate food allergies among food allergy sufferers. This helps sufferers to identify and to avoid foods that trigger allergic reactions. Hence, they will not suffer allergic reactions, simply by eliminating the source. Another significant aspect refers to the hidden ingredients used in cooking and served together with certain food, which may cause food allergies. Hence, awareness on the ingredients is integral in eliminating food allergies among food allergy sufferers. Once they are aware of the ingredients used, they can ask and check prior to consumption, particularly the 'hidden' ingredients. In addition, studies related to food allergies are in scarcity. Food allergy sufferers face extreme challenges because they are exposed to risks that may even jeopardise their lives. Public awareness on food allergy is considered minor, as they underestimate the impact of it upon food allergy sufferers, unless and until they experience the seriousness of this disease. Wrongly taken, a morsel of ingestion, cross-contact or direct contact with the food allergen can trigger the allergic reaction, and even fatality. The impact of food allergic reactions increases stress level, rate of absenteeism, and medical costs, while deteriorating quality of life. Investigation of food allergens among adults and children in Malaysia ought to help the government to carefully choose the ingredients for menu planning, especially at nurseries and schools. Finally, investigations on managing and looking into the needs of food allergy sufferers must be further explored.

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