Available Online at www.e-iph.co.uk
Indexed in DOAJ and ScienceOPEN

ASLI 2018

E-B
Environment - Behaviour Proceedings Journal

AicQoL2018PerhentianIsland
http://www.amerabra.org; https://fspu.uitm.edu.my/cebs
6th AMER International Conference on Quality of Life
Pulau Perhentian Resort, Malaysia, 03-04 March 2018
"Quality of Life in the Built & Natural Environment 6"

e-IPH
e-International Publishing House Ltd., United Kingdom

Approaches to Improving Food Allergy Knowledge: Children with Food Allergy's Quality of Life

Norrina Din[1], Basri Rashid[2], Kamal Izzuwan Ramli[2], Che Noriah Othman[1]

[1] Universiti Teknologi MARA, Penang Campus,13700 Penang, Malaysia
[2] Universiti Utara Malaysia, 06010 Sintok, Kedah, Malaysia

norrina.din@ppinang.uitm.edu.my
+6043823677

Abstract
Food allergy commonly affects many people, including children regardless of their age. Their life could be threatened if they are exposed to food allergen. Therefore, nursery employees need to take extra precaution when dealing with children with food allergy compared to ordinary children. Thus, this paper warrants to assess the knowledge of caretakers of children with food allergy and determines the approaches needed to improve their knowledge on how to manage this susceptible population.

Keywords: Food allergy, children, nursery employees, knowledge

DOI: https://doi.org/10.21834/e-bpj.v3i7.1317

1.0 Introduction

Food provides nutrients that are needed by the body, therefore consuming healthy and safe food is crucial regardless of the age of the person. However, extra caution is needed to provide food that is safe to be consumed by food allergy sufferers. This is due to the fact that, wrongly ingested food can lead to food allergy reactions and death for severe food allergy sufferers (Carrard, Rizzuti, & Sokollik, 2015). There is no cure for food allergy. Hence, prevention is the best and only way to avoid a food allergy reaction (Sicherer & Sampson, 2018). For that reason, food allergy is considered as a global health burden (Anagnostou & Orange; 2018 and Pawankar, Canonica, Holgate, & Lockey, 2011).

While a person can develop food allergy at the early stage of his/ her life (Muraro et al.,2017), food allergies are found to be present across all ages from infancy, toddlerhood, childhood, or in adulthood (Muraro et al., 2017).Consequently, food allergy sufferers must take extra precaution about the food they consume to avoid accidental ingestion (Carrard et al., 2015). There are more than 170 foods that have been identified as food allergens that could trigger food allergic reactions (Boye, 2012). However, the most common food items identified to cause food allergy are classified as the "Big 8 Allergens" (Wen, 2015). The "Big 8 Allergens" include milk, soy, fish, crustacean shellfish, eggs, tree nuts, wheat, and peanuts (Sasaki et al., 2018). The types of fish including sea bass and flounder while crustaceans and shellfish comprise of crab, shrimp, and lobster. Meanwhile, tree nuts include walnuts, almond, and pecan.

Unlike other chronic diseases, "allergy does not enjoy the same level of public and governmental attention as other chronic diseases like cancer or cardiovascular diseases and it is certainly the most pervasive disorder globally" (Pawankar et al; 2011 p.7) Therefore, the objective of the study is to assess general knowledge of food allergy. This is because assessing the level of food allergy knowledge is crucial at this stage due to the need for intervention to be developed. In this regard, accurate diagnosis of food allergy is crucial because misdiagnosis will lead to life-threatening and excessive diet restriction (Živanović, Marković, & Medjo, 2017).

eISSN: 2398-4287© 2018. The Authors. Published for AMER ABRA cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BYNC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). Peer–review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), ABRA (Association of Behavioural Researchers on Asians) and cE-Bs (Centre for Environment-Behaviour Studies), Faculty of Architecture, Planning & Surveying, Universiti Teknologi MARA, Malaysia.
DOI: https://doi.org/10.21834/e-bpj.v3i7.1317

Given the scarcity of food allergy studies in Malaysia, this study is significant in assessing the level of food allergy knowledge and types of intervention. Food allergy knowledge is a crucial issue to meet the needs of food allergy sufferers. The Ministry of Health, Ministry of Education and other authorities can help develop a food allergy management plan and can be used in nurseries and other places. This study could also contribute to the development of food allergy management, particularly in Malaysia context. Therefore, food allergy sufferers and their parents will feel safer and protected if the public understands their condition and needs.

2.0 Literature Review

2.1 Overview of food allergy and food allergy population

Food allergy is an adverse reaction of the body's immune system. To simplify, the ingested food is misinterpreted by the body's immune system, which triggers food allergy reactions. Although allergy reactions can often be mild, they can also be severe and even lead to death (Cochrane, Beyer, Clausen, Wjst, Hiller, Nicoletti, Szepfalusi, Savelkoul, Breiteneder, Manios, Crittenden, Burney, 2009). The prevalence of food allergy population has increased tremendously. Therefore, food allergy is considered as one of the health burdens of of the world (Pawankar et al., 2008). While food allergies and eczema are among the most common chronic non-communicable diseases in children in many countries worldwide, data on the burden of these diseases are still lacking, particularly in developing countries (Prescott et al., 2013 p. 1).

Eczema has been identified as a chronic skin disease (Rozalski, Rudnicka, & Samochocki, 2016). Food allergy and eczema may be experienced by the same person. Cochrane et al., (2009) found that there are connections between eczema (atopic dermatitis), asthma and food allergy. Approximately 8% of children younger than 3 years are affected by food allergy, while the occurrence of children with food allergy associated with eczema has been estimated to be as high as 30% (Cochrane et al., 2009). Here, many patients are aware that allergic reactions to food causes– eczema (Werfel et al., 2007 p. 724).

In addition, Pawankar et al., (2008), posited that people with allergies, including food allergy is will increase over the next decade, all around the world, including Asia (Lee, Thalayasingam & Lee, 2013). In this light, the prevalence of food allergy and eczema in Malaysia is approximately 90% out of the 141 children in the study (Gendeh, Mujahid, Murad, & Rizal, 2004). They further discovered that some Malaysian children are strongly allergic to crabs and shellfish.

Besides the association between food allergy and eczema, food allergy is also more apparent on children with asthma (Roberts & Lack, 2003). Thus, after a food allergy diagnosis , one should avoid certain food which could also considerably improve asthma control (Roberts & Lack, 2003 p. 205) Food allergy, eczema, and asthma (allergic diseases) have been found to be significantly correlated and therefore, to ensure their safety, these children need special obligatory attention to keep them safe. The severity of the reactions varies and has different effect on adults and children. Some could develop anaphylaxis and require hospitalization (Soh, Chiang, Huang, Woo, Ibrahim, Heng & Lee p. 1, 2017). It is believed that before management plans and prevention measure can be set up, the first and most crucial stage is assessing food providers' level of knowledge on this issue.

2.1 Quality of Life

As emphasized by Davis and Kelso (2018) the allergen prevention obligation to manage food allergy can cause significant stress for food allergy sufferers and their families. Only a small amount of food allergen is needed to trigger allergic reactions, which may diminish the quality of life of its sufferer. Food allergy affects the gastrointestinal tract, skin, and lungs and lead to fatal manifestation being anaphylactic shock (Renz, Allen, Sicherer, Sampson, Lack, Beyer & Oettgen, 2018). It can also increase the stress level and anxiety (Lagercrantz, Persson & Kull, 2017) as well as medical cost (Pawankar et al; 2011). Consequently, food allergic reactions, causes children to miss school and their parents might need to take leave to take care of their children (Abdurrahman, Kastner, Wurman, Harada, Bantock, Cruickshank and Waserman, 2013). This situation may interrupt the food allergy sufferers' education and decrease their parents' work productivity. This will bring a huge burden on the overall national economic system (Pawankar et al; 2011).

2.3 Food allergy knowledge

As mentioned, food allergy in the population is on the rise. This raises the question of whether food providers have the proper knowledge to prevent incidence of food allergic reaction. Previous studies have found that one of the major factors that contribute to the incidence of food allergic reaction is the lack of knowledge among the public as well school nurses, hospitality staff and pediatricians (Twichell, Wang, Robinson, Acebal, & Sharma, 2015; Din, Rashid & Ramli (2015) and Alherz, Husain, Al-khabaz, Moussa, & Al-refaee 2017). Therefore, determining the level of food allergy knowledge is fundamental before creating any intervention. The knowledge about food allergy includes identifying of food allergens, preparation and prevention of the food allergen to the food allergy sufferer. Bahnson, du Toit and Lack (2017) emphasized that currently, there is no cure for food allergy thus avoidance food allergen remains as the best way to prevent allergic reactions.

2.4 Intervention

Food allergy requires constant risk management in everyday life (Stjerna et al., 2014). Since there is no cure for food allergies, it is important to educate the food handlers and food providers about the importance of preventing food allergies. This is crucial especially for children who cannot identify which food is safe for them and depend solely on their food providers. Since food allergy knowledge and perceptions may influence prevention and management (Twichell et al., 2015) therefore, the implementation of intervention is desirable.

Polloni et al., (2013) had conducted a study among teachers and principals to investigate food allergy knowledge, feeling, and perception in Italy. 1184 school teachers and principal were assessed before and after attending a food allergy course. The results showed that after the food allergy course, 79.3% were able to identify the food allergen and 90.8% could recognize the most common symptoms of food allergy (Polloni et al., 2013). The authors further emphasized the need to develop a specific educational intervention and improvements to deal with food allergy sufferers to ensure the safety and well-being of food allergy sufferers (Polloni et al., 2013).

There are some misunderstandings about food allergy among medical students (Redhwan et al., 2011). It is proposed that there is a need to the continuous medical education, especially on allergy to these students because they will become physicians in the future (Redhwan et al., 2011). This is crucial because with the growing population of Malaysians with food allergy therefore public, including parents, doctors, teacher, nursery employees, and food service staff must understand the need of food allergy sufferers.

3.0 Methodology

A cross-sectional study using online survey was conducted among employees of public nurseries in Penang to determine the general food allergy knowledge and the types of intervention. Nursery employee is because as emphasized by Polloni et al., (2013), the chances of the school personnel fronting the food allergic reactions are at risk and at least one case of food allergic reactions occurred at school or nurseries. Therefore, the school or nurseries need to manage this susceptible population and need to ensure that the safety of this susceptible population (Polloni et al., 2013). In addition, the food allergies sufferers spend more time there and rely on the nursery employee while their parents working (Kim, Yoon, Kwon, Kim, & Han, 2012). The age of the study is between 2 to 6 years old.

The questionnaire was developed and adapted by the researcher based on Al-herz et al., (2017) and Gupta et al., (2009). The survey asked about the respondents' profile, general food allergy knowledge and the types of intervention that can improve their knowledge. A total of 297 out of 600 nursery employees participated in the survey. Based on Krecjie and Morgan (1970), the population is 600 therefore sample sizes is 234. Thus, the total populations of this study are acceptable that is more than it required for sampling size based on Krecjie and Morgan (1970). The data analyzed by using Statistical Package for the Social Science (SPPS) version 22.

4.0 Findings & Discussions

4.1 Demographic profile

Understanding the demographic profile is crucial to assess the information needed by the researcher before the instrument could be developed for further research. The questionnaire comprise of items on the general knowledge on food allergy. Specific questions to assess the food allergy knowledge in detail would be formulated based on the respondents' demographic profile. First, the result revealed that the majority of the respondents possess certification of formal education, including Sijil Rendah Peperiksaan/ Penilaian Menengah Rendah (SRP/PMR), Sijil Pelajaran Malaysia (SPM), Sijil Pelajaran Tinggi Malaysia (STPM), diploma and degree. In terms of education level, the majority of the respondents graduated with diploma (51.2%, n=152), followed by Sijil Pelajaran Malaysia (SPM) (37%, n=109). Only one respondent has no formal education certificate (0.3%).This shows that most respondents have formal education. The majority of the respondents are working as a teacher (79.5%, n=236). Meanwhile, all of the respondents are female and Malay (100%, n= 297). The majority of the respondents are aged between 26-35 (99%, n=33), followed by 46-55 (27%, n= 81),36-45 (23%, n=67), 18-25 (9%, n=27) and lastly, 55 and above (7.7%, n=23).

Nursery employees in this study refer to people working in the nurseries who are direct and indirectly involved in handling the children in the nursery. The majority of the respondents are teachers (79.5%, n=236) followed by nursery cooks (16.5%, n=49) and supervisors (2%, n=6). In addition, the majority of the respondents had worked experience more than 5 years (77.4%, n=230) while others worked less than 6 months (9%, n=27), followed by working experience between 3-4 years (7.1%, n=21) and lastly is 1-2 years working experience (6.4%, n=19).

According to Lanser, Covar, & Bird (2016), the place of childcare like nurseries is important because the person in charge will encounter the food allergies. However, the authors further added that the level of education and understanding of food allergy as well as anaphylaxis is deficient in information. Therefore, this study warrants investigating the general knowledge of food allergy among nursery employee.

4.2 Food allergy knowledge and Intervention

Out of the 297 nursery employees participated in this survey, 250 (84%) of them claimed to having knowledge on food allergy, whereas 47 (16%) of them claimed to have no knowledge about food allergy. Lack of awareness towards food allergy is one of the reasons for the lack of knowledge on food allergy. In addition, some of the respondents are newly appointed workers with little experience on handling children with food allergy. The respondents were asked only general questions because this is an exploratory study to investigate the awareness and understanding of the respondents towards food allergy. The data obtained were used as inputs to develop food allergy knowledge instrument for future research.

Table 1: Types of intervention

Types of intervention	Frequency (n=297)	Percentage (%)
Food allergy poster	43	15
Food allergy training	76	26

Food allergy brochure	93	31
Food allergy campaign	59	20
Food allergy management plan	26	8

They were further asked to choose which intervention that can improve their knowledge, even though they declared that they already have the knowledge about food allergy. As shown in Table 1, the majority of the respondents (31%, n=93) chose food allergy brochures as the best mean to increase their knowledge while 26% (n=76) prefer to attend food allergy training. This is followed by 20% (n=93) of them who prefer food allergy campaign. Food allergy management plan was found to be the least favored by the respondents (8%, n=26)

A prior study has established that intervention can improve food allergy knowledge (Polloni et al., 2013). This study attempts to explore the intervention preferred by nursery employees to increase their knowledge pertaining to food allergy. As suggested by Greiwe et al., (2014), food allergy training is needed to improve food allergy knowledge and management. Whereas, Polloni et al., (2013) discovered that teachers and principals have improved their knowledge on food allergy after attending the training. However, in this study, the respondents prefer information to be presented in form of brochures on food allergy. The result is different from the previous studies due to several reasons, such as different demographic profile, country, culture, attitudes, food allergy education and awareness. Based on these justifications, simple, precise and accurate information is needed to produce food allergy brochures for Malaysians to increase food allergy awareness. This information will give the opportunity for the researcher to develop brochures that could increase knowledge and awareness on food allergy.

5.0 Conclusion

In conclusion, since there is a considerably high prevalence of food allergy, more accurate management of food allergy is needed. This paper provides evidence pertaining to food allergy, to increase awareness and knowledge from the Malaysian's perspective. Based on the survey, it was found that the majority of nursery employees are knowledgeable about food allergies. When it comes to imparting information about food allergy, brochure was found to be the most favored means of information in terms of educating the nursery employees regarding food allergies. This shows that even though they have the basic knowledge about food allergy, an available source of information is always welcomed to keep them up to date and also as a source of information that they can always refer to. Therefore, this study shows the need for academicians, medical professional, food safety trainers and others to work meticulously to help develop the right source of information for everyone. This is to provide the assurance for the allergy sufferers that they can enjoy safe food in safe the environment due to better prevention strategies for food allergy.

Acknowledgements

Thank you, Allah for giving me this opportunity to complete this research. I would like to express my gratitude to the Jabatan Kemajuan Masyarakat (KEMAS) for giving the permission to conduct this study and Universiti Teknologi MARA for giving monetary support to present this paper.

References

Abdurrahman, Z.B., Kastner, M., Wurman, C., Harɛda, L., Bantock, L., Cruickshank, H. and Waserman, S., 2013. Experiencing a first food allergic reaction: a survey of parent and caregiver perspectives. Allergy, Asthma & Clinical Immunology, 9(1), p.18.

Al-Herz, W., Husain, K., Al-Khabaz, A., Moussa, M.A. and Al-Refaee, F., 2017. Awareness of food allergies: a survey of pediatricians in Kuwait. BMC Pediatrics, 17(1), p.11.

Anagnostou, K., & Orange, J. S. (2018). The Value of Food Allergy Prevention in Clinical Practice in Pediatrics: Targeting Early Life. *Children*, *5*(2), 14.

Bahnson, H.T., du Toit, G. and Lack, G., 2017. Statistical considerations of food allergy prevention studies. The Journal of Allergy and Clinical Immunology: In Practice, 5(2), pp.274-282.

Boye, J.I., 2012. Food allergies in developing and emerging economies: need for comprehensive data on prevalence rates. Clinical and translational allergy, 2(1), p.25.

Carlisle, S.K., Vargas, P.A., Noone, S., Steele, P., Sicherer, S.H., Burks, A.W. and Jones, S.M., 2010. Food allergy education for school nurses: a needs assessment survey by the consortium of food allergy research. The Journal of School Nursing, 26(5), pp.360-367.

Carrard, A., Rizzuti, D., and Sokollik, C., 2015. Update on food allergy. *Allergy*, *70*(12), pp.1511-1520.

Cochrane, S., Beyer, K., Clausen, M., Wjst, M., Hiller, R., Nicoletti, C., Szepfalusi, Z., Savelkoul, H., Breiteneder, H., Manios, Y. and Crittenden, R., 2009. Factors influencing the incidence and prevalence of food allergy. Allergy, 64(9), pp.1246-1255.

Davis, C. M., & Kelso, J. M. (2018). Food Allergy Management. *Immunology and Allergy Clinics*, *38*(1), 53-64.

Din, N.B., Rashid, B. and Ramli, K.I., 2015. Gauging Food Allergy Knowledge among Hospitality Students. *Journal of Management Research*, *7*(2), p.252.

Gendeh, B.S., Mujahid, S.H., Murad, S. and Rizal, M., 2004. Atopic sensitization of children with rhinitis in Malaysia. *The Medical Journal of Malaysia*, *59*(4), pp.522-529.

Greiwe, J.C., Pazheri, F. and Schroer, B., 2015. Nannies' knowledge, attitude, and management of food allergies of children: an online survey. *The Journal of Allergy and Clinical Immunology: In Practice*, *3*(1), pp.63-67

Gupta, R.S., Kim, J.S., Springston, E.E., Pongracic, J.A., Wang, X. and Holl, J., 2009. Development of the Chicago Food Allergy Research Surveys: assessing knowledge, attitudes, and beliefs of parents, physicians, and the general public. BMC health services research, 9(1), p.142.

Kim, S., Yoon, J., Kwon, S., Kim, J. and Han, Y., 2012. Current status of managing food allergies in schools in Seoul, Korea. Journal of Child Health Care, 16(4), pp.406-416.

Lagercrantz, B., Persson, Å. and Kull, I., 2017. "Healthcare seems to vary a lot": A focus group study among parents of children with severe allergy. Journal of Asthma, pp.1-7.

Lanser, B.J., Covar, R. and Bird, J.A., 2016. Food allergy needs assessment, training curriculum, and knowledge assessment for child care. Annals of Allergy, Asthma & Immunology, 116(6), pp.533-537.

Lee, A.J., Thalayasingam, M. and Lee, B.W., 2013. Food allergy in Asia: how does it compare?. *Asia Pacific Allergy*, *3*(1), p.3.

Muraro, A., Lemanske, R.F., Castells, M., Torres, M.J., Khan, D., Simon, H.U., Bindslev-Jensen, C., Burks, W., Poulsen, L.K., Sampson, H.A. and Worm, M., 2017. Precision Medicine in Allergic Disease–Food Allergy, Drug Allergy, and Anaphylaxis-PRACTALL document of the European Academy of Allergy and Clinical Immunology and the American Academy of Allergy, Asthma & Immunology. Allergy.

Pawankar, R., Canonica, G.W., Holgate, S.T., and Lockey, R.F., 2011. World Allergy Organization (WAO) white book on allergy. Wisconsin: World Allergy Organisation. Available online at: http://www. worldallergy. org/UserFiles/file/WAO-White-Book-on-Allergy web. pdf.

Peniamina, R.L., Bremer, P., Conner, T.S. and Mirosa, M., 2014. Understanding the needs of food-allergic adults. Qualitative health research, 24(7), pp.933-945.

Polloni, L., Lazzarotto, F., Toniolo, A., Ducolin, G. and Muraro, A., 2013. What do school personnel know, think and feel about food allergies?. Clinical and translational allergy, 3(1), p.39.

Prescott, S.L., Pawankar, R., Allen, K.J., Campbell, D.E., Sinn, J.K., Fiocchi, A., Ebisawa, M., Sampson, H.A., Beyer, K. and Lee, B.W., 2013. A global survey of changing patterns of food allergy burden in children. *World Allergy Organization Journal*, *6*(1), p.21.

Renz, H., Allen, K. J., Sicherer, S. H., Sampson, H. A., Lack, G., Beyer, K., & Oettgen, H. C. (2018). Food allergy. *Nature Reviews Disease Primers*, *4*, 17098.

Rożalski, M., Rudnicka, L. and Samochocki, Z., 2016. Atopic and Non-atopic Eczema. Acta Dermatovenerologica Croatica, 24(2), pp.110-110.

Sasaki, Mari, Jennifer J. Koplin, Shyamali C. Dharmage, Michael J. Field, Susan M. Sawyer, Vicki McWilliam, Rachel L. Peters et al. "Prevalence of clinic-defined food allergy in early adolescence: The SchoolNuts study." *Journal of Allergy and Clinical Immunology* 141, no. 1 (2018): 391-398.

Sicherer, S. H., & Sampson, H. A. (2018). Food allergy: A review and update on epidemiology, pathogenesis, diagnosis, prevention, and management. *Journal of Allergy and Clinical Immunology*, *141*(1), 41-58.

Soh, J.Y., Chiang, W.C., Huang, C.H., Woo, C.K., Ibrahim, I., Heng, K., Pramanick, A. and Lee, B.W., 2017. An unusual cause of food-induced anaphylaxis in mothers. *World Allergy Organization Journal*, *10*(1), p.3.

Werfel, T., Ballmer-Weber, B., Eigenmann, P.A., Niggemann, B., Rance, F., Turjanmaa, K. and Worm, M., 2007. Eczematous reactions to food in atopic eczema: position paper of the EAACI and GA2LEN. *Allergy*, *62*(7), pp.723-728.

Zivanovic, M., Atanasković-Marković, M., Medjo, B., Gavrović-Jankulović, M., Smiljanić, K., Tmušić, V. and Djurić, V., 2017. Evaluation of Food Allergy in Children by Skin Prick Tests with Commercial Extracts and Fresh Foods, Specific IgE and, Open Oral Food Challenge-Our Five Years Experience in Food Allergy Work-up. *Iranian Journal of Allergy, Asthma, and Immunology*, *16*(2), p.127.