

Parental Knowledge And Awareness And Towards Allergy Prevalence In Selangor

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Abstract

The allergy epidemiology is another worldwide problem as its prevalence trigger troublesome amongst society. Malaysia as a developing country has no exception towards it. Family as a fundamental institution as well as the simplest unit of the society have significant roles to put a bridle on the issues. Allergies are known to cause social and economic burden of the sufferer and to the close family member. Parental knowledge, attitude and practice plays a crucial role in allergy prevalence, prevention and treatment strategy. In Malaysia, the misconception of certain allergy symptom and prevention becomes another real challenge. Poorly self-perceives as the early diagnosis approach could lead to improper clinical diagnosis thus affects the treatment accuracy. It then brings about the delay of appropriate treatment and upturn the treatment cost. In certain urgent allergy conditions, such as anaphylaxis, a delay is lethal to the sufferer. This paper highlights the paternal and maternal knowledge, awareness and practice towards allergy disease. This study also presents the important of having adequate knowledge to self-perceive of allergy disease. As this approach is useful to give surface overview on allergy prevalence, adequate knowledge compromises of precise manifestation. This cross-sectional study involves 117 pair of parents in Selangor with the age ranged from 28-61 years old. A self-administered questionnaire has been used to indicate respondent's allergy status, their knowledge, awareness and practice towards allergy disease. As overall, the common symptom of allergy among parents were allergy rhinitis, eczema and dry and itchy rashes at skin with the percentage of prevalence ranged between 6.8% to 28.4%. The data also indicated the effect on insufficient of knowledge and awareness among parents towards their decision on treatment and prevention plan. Most parents do not have adequate understanding on the relatedness of immune system abnormality reaction of allergy as well as the roles of immune system component such as Immunoglobulin E (IgE) in allergy reaction. They also have insufficient knowledge about the crucial allergy mechanism such as the cross-reaction activity and the difference between food allergy and food intolerances. Pearson correlation between knowledge of allergy term, cause and symptom with allergy prevention and treatment shows positive significant correlation with ($r = 0.244, P=0.008$) for maternal and ($r = 0.262, P=0.004$) for paternal respectively. Parents with inadequate knowledge about allergies symptom have limited ability to choose the treatment and prevention for allergy disease. As the shortcoming, they tend to do unnecessary dietary elimination and extreme food avoidance as well as disregards the important to consult with the healthcare professional regarding their allergy symptom. Overall, parental knowledge in society represent their involvement in prevention and treatment strategy for allergy sufferer especially their children. Adequate knowledge and awareness of this unit of society conceded a better future to control allergy prevalence among children.

Keywords: Allergy, parental knowledge, parental awareness, self-perceive.

Abbreviations: Immunoglobulin E (IgE)

Introduction

Allergy diseases has been discussed globally from diverge views including its epidemiology to its possible associated risk factor. Allergy can be defined as an adverse reaction promoted by abnormal

immunological mechanisms towards specific allergen (Nasr & Wahshi, 2017; ASCIA, 2016). Allergy is a multifactor disease that outlined the genetic inheritability as the main cause. However, dietary culture environmental and climate changes, has also been identified as the confounding factors that contribute to allergy. In addition, the changes either restriction or limitation towards environmental exposures may resulted to enhance or suppress the allergy epidemic respectively (Nasr & Wahshi, 2017). For example, hygiene improvement, minimization of family sizes and advancement of infection control in society life style resulted to an “under-challenged” immune system while too much exposure to environmental changes such as pollution also harmful since immune system have to be in a constant state of a terror (Nasr & Wahshi, 2017).

The variation of allergy prevalence in Asia as well as in Malaysia are much more liable on several factor such as geographical location, sociodemographic factor and environmental factor (Lee & Shek, 2014). Atopic march is the mechanisms of allergy which explains the progress of allergy starting from infant until adulthood (Malaysia Allergy Prevention, 2014; Yadav, 2001; Ruby *et al.*, 2013). Statistical data from Malaysia Allergy Prevention (MAP) in 2014 indicated that runny blocked nose and wheezing as the common symptom of allergy among children at 15.2% and 12.5% respectively followed with asthma and eczema. In another study (Ruby *et al.*, 2013), this pattern of allergy prevalence shifted from atopic dermatitis to another allergy symptom such as rhino conjunctivitis and rhinitis in older children. It is also supported in another study in Malaysia that among 7132 respondents, both food allergy and allergy rhinitis represented high prevalence with 55.2% and 29.1% respectively during adulthood (Murugappan, 2016).

Parental knowledge and practice towards allergy prevention are vital to promote effective allergy management. As a unit, parents play the most crucial role to face and overcome the prevalence of allergy among themselves as well as their children. When food allergy epidemically grows over time, the number of parents who faced this challenge grows as well. The quality of life of parents and families with food-allergic children are badly affected even for common family activity. As example activity such as meal preparation and leisure sport activities will be limited since many factors must be considered for allergy sufferer (Chong & Chew, 2018; Ruby *et al.*, 2013) [39]. Previous studies showed that children with severe allergy affected working parents especially the mothers emotionally and economically (Marklund *et al.*, 2007; Thalayasingan & Lee, 2013)[39]. Compared to fathers, mothers seemed to experience a stronger negative impact on quality of life when dealing with this case (Hoehn *et al.*, 2017). Difficulties in managing the needs of these allergic children such as their requirements for special medication and allergen-free food causes parents to take extra care in their daily lives (Marklund *et al.*, 2007) [40]. Social isolation does occur among parents with allergy children and this makes them belief that they are not fully supported and well understood by the community or general public (Chong & Chew 2018).

The misconceptions about allergy definition, symptoms and prevalence is the common scenario nowadays. Even within the same populations, there always be a conflicting idea about when and how certain allergy symptom occurs. Other than that, their concern relies on the sources of allergen that trigger the allergy reaction. As example, parents’ belief that food additives such as food colouring as the common allergens to cause asthma (Australasian Society of Clinical Immunology and Allergy, 2019) [40]. They also belief that any symptom of food intolerance as allergy reaction (Australasian Society of Clinical Immunology and Allergy, 2019). On the other hand, the study among primary care physicians indicated that the prevalence of food allergy is higher among society (Redhwan *et al.*, 2011). However, the truth that lying behind this is the fact that, not all allergy symptom is triggered by or similar to food allergy. They also misjudge allergy as harmless disease that can be treated and will go away naturally (Redhwan *et al.*, 2011). Another study which was done among paediatricians and physicians showed that there were inconsistencies in their understanding of food allergy symptoms even though both are conversant with food allergy and anaphylaxis term and symptom (Espa *et al.*, 2018). As example, they believe that eczema does not comes from food allergy. In fact, 35% of infants and toddlers with atopic dermatitis have food allergy (Espa *et al.*, 2018).

Materials and Methods

A cross-sectional quantitative study was conducted at Selangor, Malaysia. This research received an ethical approval from Research Ethical Committee University Technology Mara (UiTM). A sample size of 117 of married couple were chosen to complete the survey. The sample size calculation was determined using Epi Info™ software (population survey). A specified absolute precision with anticipated population (P) of 40% or 0.5, 95% confidence interval (at a Z-score of 1.96) and absolute precision of 5%, and a 10% non-response rate (Wheatly & Toggias, 2015). The convenience sampling method was used from January 2019 to April 2019 to cater the number of respondents. The questionnaire was design in mixed dichotomous question with yes, no and not sure answer. The question was constructed and adapted based on various literature sources from references (American Academy of Allergy Asthma and Immunology, 2017; ASCIA, 2016; Lodge *et al.*, 2013). Part I of the questionnaire outlined the demographic factor, followed with Part II with indication of self-perceive of allergy, awareness of allergy term and symptom and also knowledge on prevention and treatment. The reliability of the questionnaire regarding allergy term, cause, symptom, prevention and treatment was validated using the test-retest reliability. Twenty respondents were chosen in which they were required to answer 18 questions. A week later, they are required to re-answer the same questionnaire. The mark before and after one week were analyze using bivariate correlation in which a highly significant strong correlation was obtained ($r = 0.930$, $p < 0.001$, $n = 25$). Data was analyzed using Statistical Package for the Social Sciences (SPSS) version 25 using descriptive, frequency and Pearson correlation analysis.

Result and Discussion

Table 1 shows the sociodemographic data of 117 married couple with overall $n = 234$. Mother's age ranged from 28 to 58 years old with the mean 46.49 ± 6.685 while father's age ranged from 30 to 61 years old with the mean 49.49 ± 6.956 . Malay is the major ethnicity represented in this study with $n = 112$ (95.7%) of mother with $n = 107$ (91.5%) of father. The common education qualification among respondents was degree holder with $n = 45$ (38.5%) and $n = 41$ (35%) for mother and father respectively. The second highest frequency of education level was master's degree holder $n = 10$ (8.5%) among mother and $n = 16$ (13.7%) among father. Most respondents among mother are a housewife with $n = 50$ (42.7) followed with the government servant with $n = 39$ (33.3%). However, among father, majority of them $n = 36$ (30.8%) were working in private sector followed with government servant with $n = 32$ (27.4%). $n = 21$ (17.9%) of father were declared as unemployed since they were retired at the certain age depending on their career. $n = 12$ (10.3%) and $n = 15$ (12.8%) of respondents among mother and father respectively perceived themselves to have chronic illness.

Table 1: Sociodemographic Data

Characteristic	Mother			Father		
	n	Mean ± S.D	Range or Percent	n	Mean ± S.D	Range or Percent
Age	117	46.49 ± 6.685	28-58	117	49.49 ± 6.956	30-61
Races						
Malay	112		95.7	107		91.5
Chinese	1		0.9	4		3.4
Indian	1		0.9	1		0.9
Others	3		2.6	5		4.3
Highest Education Level						
PhD	0		0.0	5		4.3
Master Degree	10		8.5	16		13.7
Degree	45		38.5	41		35
Diploma	10		8.5	13		11.1

	Matriculation / Foundation / STPM	11		9.4	11		9.4
	Secondary School	41		35.0	31		26.5
Employment							
	Government	39		33.3	32		27.4
	Private	22		18.8	36		30.8
	Freelance	6		5.1	28		23.9
	Unemployed / Housewife	50		2.7	21		17.9
Chronic Illness							
	Yes	12		10.3	15		12.8

Table 2 indicated the prevalence of allergy and its symptom among respondents. The common allergy symptom and disease among parents was allergy rhinitis with n=12 (10.3%) of mothers and n=32(27.4%) of fathers respectively. For mothers, it followed with eczema and dry and itchy rashes at skin with n=11(9.3%), itchy nasal cavity with n=9(7.7%) and sneezing with n=6(5.1%). For fathers, it followed with sneezing, dry and itchy rashes at skin, runny and block nose and itchy nasal cavity with n=9(7.7%), n=8(6.8%), n=7 (6%) and n=6(5.15) respectively. This data was comparable to other data from another country such as South Korea with 27% in (An *et al.*, 2015) and United Arab Emirates with 32% (Alsowaidi *et al.*, 2010). Another study done in Malaysia among adult indicated 29.1% of the respondents to suffer allergy rhinitis (Murugappan, 2016). Both symptom such as sneezing and itchy nasal cavity (Espa *et al.*, 2018) nasal pruritus, airflow obstruction, and mostly clear nasal discharge (Ruby *et al.*, 2013) were known as allergy rhinitis clinical symptom (Espa *et al.*, 2018). Besides, another study also indicated that among 128 adults who diagnosed with allergy rhinitis in Malaysia, most of them also diagnosed with food allergy. It proves that both allergy disease are interrelated through cause and effect relationship (Al-Abri *et al.*, 2018; Wan Mohamad *et al.*2016).

References (Espa *et al.*, 2018) and (Nasr & Wahshi, 2017) indicated that the personal and parental education, stress level and climate change as the biggest threat for allergy prevalence regardless of the inheritance factor. Table 3 and 4 indicated the knowledge among parents regarding, the term, symptom, cause, prevalence and treatment of allergy.

Table 2: Allergy Prevalence by self-perceive method

		Mother (n=117)		Father (n=117)	
		n	%	n	%
Allergy	Rhinitis	12	10.3	32	27.4
	Conjunctivitis	0	0.0	1	0.8
	Eczema	11	9.3	2	1.7
	Anaphylaxis	0	0.0	2	1.7
	Asthma	3	2.5	1	0.8
	Dry and itchy rashes at skin	11	9.3	8	6.8
	Sneezing	6	5.1	9	7.7
	Itchy Nasal Cavity	9	7.7	6	5.1
	Prolonged cold	1	0.8	1	0.8
	Runny and block nose	5	4.3	7	6.0
	Itchy and red eyes	5	4.3	3	2.6
	Shortness of breath	3	2.6	0	0.0
	Wheezing	1	0.8	0	0.0

	Hives	3	2.5	0	2.8
	Swelling of eyes and mouth	0	0.0	0	0.0
	Diarrhoea	2	1.7	1	0.8
	Blood in stool	2	1.7	3	2.6

Table 3: Descriptive analysis of parental knowledge on allergy term, cause and symptom

	Knowledge of cause and symptom	Answer	Mother	Father
			%	%
1	Food allergy is normal immune reaction	Yes	64.1	56.4
		No*	16.2	22.2
		Not sure	19.7	21.4
2	Allergy cause by IgE, non-IgE mediated or both	Yes*	16.2	12.8
		No	12.8	15.4
		Not sure	70.9	71.8
3	Proteins as the main cause of allergy	Yes*	21.4	20.5
		No	30.8	31.6
		Not sure	47.9	47.9
4	Allergy only occur at the skin	Yes	45.3	39.3
		No*	33.3	34.2
		Not sure	21.4	26.5
5	Allergy symptom can worsen to severe one called anaphylaxis	Yes*	46.2	37.6
		No	12.8	18.8
		Not sure	41.0	43.6
6	Allergy from one food can cross-reacted	Yes*	25.6	25.6
		No	28.2	26.5
		Not sure	46.2	47.9
7	Kids with allergy parent have higher risk to suffer allergy	Yes*	53.0	48.3
		No	17.9	19.0
		Not sure	29.1	32.8
8	Allergy only cause by food not environment	Yes	10.4	8.5
		No*	67.8	70.1
		Not sure	21.7	21.4
9	Food intolerance is similar with food allergy	Yes	48.7	49.6
		No*	21.4	18.8
		Not sure	29.9	31.6
10	Maternal diet can affect allergy of EBF infant	Yes	55.6	53.8
		No*	12.0	14.5
		Not sure	32.5	31.6
Asterisk (*) indicates correct answer				

As overall, it can be summarized that both parents having difficulty to determine allergy correctly. Over half respondents, 64.1% of mother and 56.4% of mother overlooked allergy as normal immune reaction. It also reported in Australia and New Zealand (Australasian Society of Clinical Immunology and Allergy, 2019) and Malaysia itself (Malaysia Times, 2016) that allergy is harmless and can be ignored. However, respondent's knowledge on anaphylaxis as a severe allergy circumstances that can be lethal (Ruby *et al.*, 2013) is on the rise since 46.2% and 37.6% of mothers and fathers respectively answer the question correctly. This outcome was against the statement in

(Murugappan, 2016) that considered public knowledge was low as 71% of the respondents stated that they do not know about anaphylaxis. According to one study in Singapore (Soon, 2018), due to the well awareness on anaphylaxis of public especially at childcare center and school, the level of anaphylaxis prevalence in this country was relatively low. This shows that knowledge is crucial among public to identify anaphylaxis or another acute allergy reaction earlier via its clinical presentation, thus aids in proper diagnosis and management (Goh *et al.*, 2018).

In terms of immunology aspect, only 16.2% and 12.8% of mothers and fathers respectively knows about the roles of Immunoglobulin E (IgE) in allergy reaction. Only 24.1% and 20.5% of mothers and father respectively answer correctly about the involvement of protein component as the major source of allergen to cause allergy. Other than that, more than half respondents were not well known about the pathophysiological of allergy. 45.3% of mothers were agree that allergy symptom will only occur at skin while 21.4% of them not sure about it. The outcome was also similar with father that only 34.2% of them answer this question correctly. The understanding about the cross-reactivity potential of allergy also was relatively low among parents since only 25.6% of both were well-known about it. Conversely, parental concern about the risk factor of inheritability was relatively high. Almost half respondents with 53% of mother and 48.3 % of father known that the risk of their children to have allergy are double if both parents also have allergy. This is believed to cause by massive education program of allergy disease by Malaysia government that pointed on this fact. One of it was from Malaysian Society of Allergy & Immunology (MSAI) which in the guideline indicated that risk of allergy disease in child will increase up to 60 to 80% if both parents have allergy history (Malaysia Allergy Prevention, 2014). Malaysia as known to have diverse dietary culture according to its multi-ethnic population, always faced arguments about the sources of allergen especially from food. As the prevalence keep on rising, parental concern about another factor such as the environmental factors to cause allergy also rises. About 67.85% of mother and 70.1% of father correctly answer that environmental is another crucial multifactor to cause allergy rather than food which was relatively higher.

Food allergy is another common allergy disease the affect the whole family as a unit. Its prevalence affects their general health status and disrupted them psychologically through quality and social life impairment (Chong & Chew, 2018). The common misunderstanding about food allergy was the misunderstanding of food allergy as similar to food intolerance (Chong & Chew, 2018). It is paralleled with this study outcome that only 21.4% of mother and 18.8% of father answer that both are the two different disease. Food intolerance differ in terms of its mechanism where it is involving difficulty to digest the food without any immunological involvement like happen in food allergy (Gupta *et al.*, 2008). It is common among society to assume the two as similar abnormality since the symptom for both is quite resembles except food allergy which always lead to other serious complication such as anaphylaxis but not in the case of food intolerances.

Table 4 represents parental practice on allergy treatment and prevention. Taking care of allergy sufferer especially the children was determined as one of the challenging tasks by parents (Redhwan *et al.*, 2011). Food avoidance is known to be the common prevention approach among them (Redhwan *et al.*, 2011; Gupta *et al.*, 2008). In this study, 67.5% and 60.7% of mother and father respectively agree that kids with eczema must avoid several foods such as egg and seafood that potentially cause allergy reaction. It was supported by the study among health care professionals that 80% of them was agree that food avoidance is effective treatment strategy for food allergy (Redhwan *et al.*, 2011). Attitude on allergy treatment also can be showed from the statement that certain food should be eliminated at all from diet to avoid allergy reaction. About 76.1% of mothers and 71.6% of father agree that food elimination should be applied if the symptom is presence without consultancy. It also paralleled with another study in Malaysia that 60% of the respondents choose food elimination as the best way to avoid allergy cases (Redhwan *et al.*, 2011). However, there were always limitation for the food avoidance and dietary elimination practice. Extreme avoidance or long-term elimination without proper clinical diagnosis of allergy known to be unnecessary and impractical. It could lead to neglecting particular nutrient for long-term from food which necessary for the body. Thus, preventive measures or

treatments without the seeking proper consultancy with the specialist also have an impact on the health of the allergy patient.

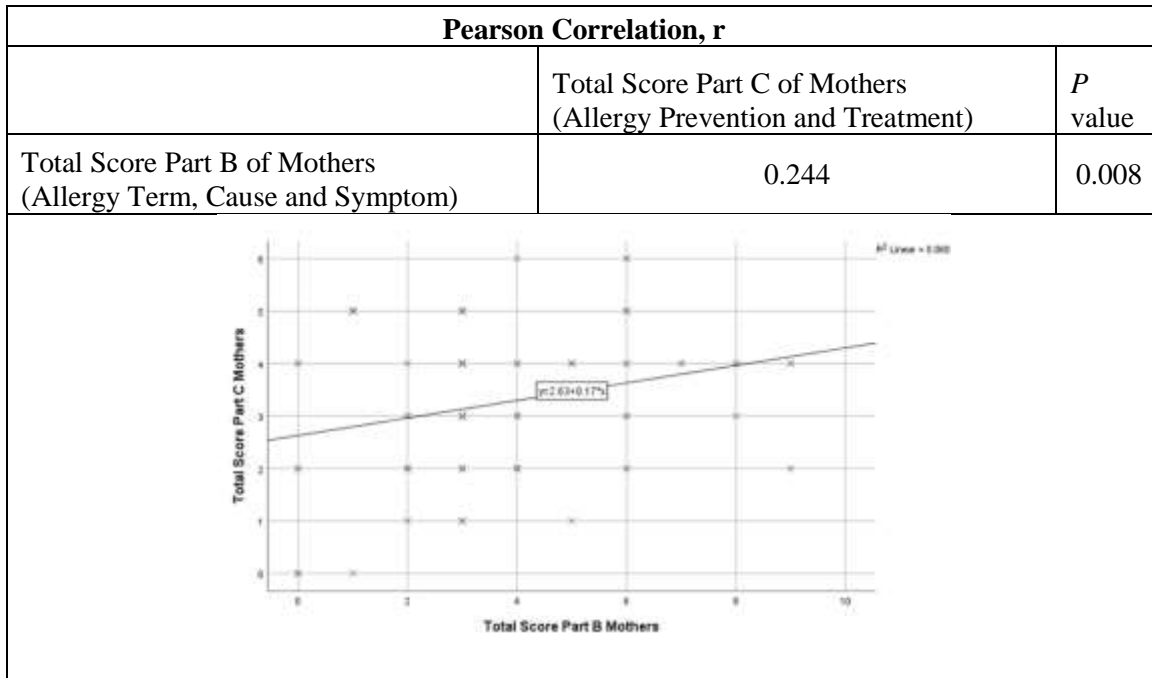
Table 4: Descriptive analysis of parental attitude and practice on allergy treatment.

	Preventive and treatment practice	Answer	Mother	Father
			%	%
1	Kids with eczema should avoid food that trigger allergy	Yes*	67.5	60.7
		No	13.7	15.4
		Not sure	18.8	23.9
2	Parent should avoid or delay the given of high-risk food that cause allergy	Yes	46.2	33.3
		No*	29.9	29.1
		Not sure	23.9	29.1
3	Food that causes allergy should be eliminated from diet	Yes*	76.1	71.6
		No	7.7	11.2
		Not sure	16.2	17.2
4	No cure for allergy except to reduce its symptom	Yes*	51.3	39.3
		No	22.2	29.9
		Not sure	26.5	30.8
5	Steroid and antihistamine cream are example of suitable treatment for kids	Yes*	48.7	41.0
		No	12.0	17.9
		Not sure	39.3	41.0
6	People with allergy should read the food label before eating	Yes*	75.2	66.7
		No	12.8	17.1
		Not sure	12.0	16.2
7	Blood test is only way to diagnosed allergy	Yes	39.3	38.5
		No*	27.4	24.8
		Not sure	33.3	36.8
asterisk (*) indicates correct answer				

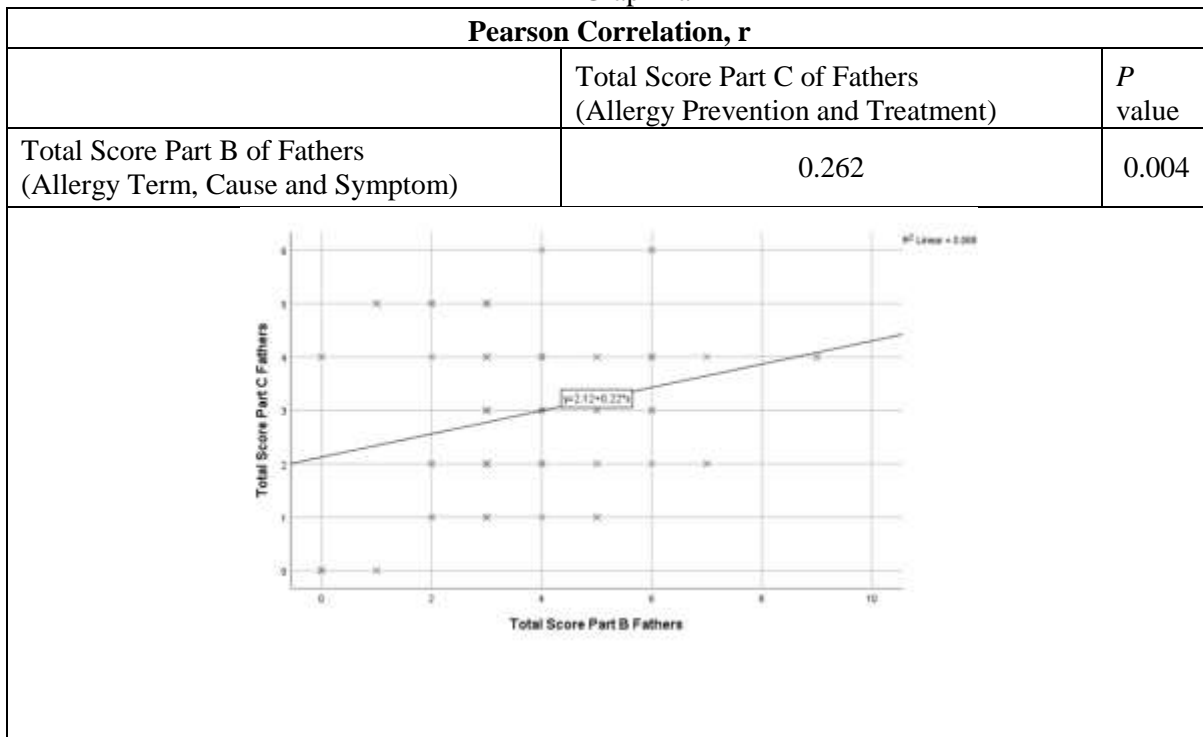
On the other hand, most respondents 75.2% of mother and 66.7% of father answer correctly to the question about the important practice on reading food label for allergy sufferer. They seem to have enough knowledge about it due to strictly enforcement of government law about food labelling especially to the food allergy sufferer (Cezmi *et al.*, 2015). This good practice among public will reduced the risk of food allergy prevalence (Soon, 2018). However, there only 51.3% of mother which slightly higher compared to father with 39.3% who well known that there was no cure for allergy. It is paralleled to the previous study that 53% of the respondents responded wrongly that allergy can be healed (Redhwan *et al.*, 2011; Australasian Society of Clinical Immunology and Allergy, 2019). Steroid and antihistamine are common in the treatment of eczema among kids with 48.7% of mothers and 41% of fathers indicate both as suitable treatment for eczema. However, only 27.4% of mothers and 24.8% of father were correct about allergy diagnosis that only restricted to blood test. In fact, allergies should be diagnosed through a combination of medical history, elimination diets, skin-prick tests (SPT), radioallergosorbent tests (RAST), and oral food challenges (OFC) (Wang, 2010). As outlined by MAP (Malaysian Allergy Prevention, 2014), allergy prevention involves four steps; risk identification through family history at genetic inheritance level, environmental manipulation such as avoidance and restriction to allergen source, primary prevention to reduce prevalence and secondary prevention to reduce morbidity using immunotherapy as example. Overall, in this study parental preventive practice mark at the step 2 but rarely continuous to advance step 3 and 4.

Parental knowledge of allergy is important in order to determine the level of risk faced by

children especially who genetically inherited (Arshad *et al.*, 2012). Graph 1(a) and (b) presented the correlation between the knowledge of allergy term, cause and symptom with practice on allergy prevention and treatment using Pearson correlation. Both showed significant correlation with ($r = 0.244$, $P=0.008$) for mother and ($r = 0.262$, $P=0.004$) for father. Paternal knowledge indicated more significant contribution towards allergy preventive strategy and need to be improved compared to maternal knowledge. These results are highly relevant, since mother seem to have more involvement in managing allergy kids compared to father [39].



Graph 1a



Graph 1b

Graph 1a and 1b: Pearson correlation between respondent’s knowledge of allergy term, cause and symptom with allergy prevention and treatment

Conclusion

As prevalence cases staggering increase in Malaysia, society acknowledgement at the very basic level such as a family conciliated better future for allergy epidemic. In many allergy circumstances, such as food allergy and anaphylaxis, constant risk management strategy its compulsory in daily life of the sufferer. Therefore, the implementation of intervention in terms of educational and informative program related to allergy is desirable to enhance and empower allergy knowledge and awareness among society.

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