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RESEARCH ARTICLE

Food Allergy Knowledge and Attitudes Among School Teachers in Jazan, Saudi Arabia

Gassem Gohal*

Department of Pediatrics, Faculty of Medicine, Jazan University, Jazan, Saudi Arabia

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Abstract:

Background:

Food allergy topic has become more widely discussed in developed countries, but with less interest in Middle Eastern Arabian Countries.

Objectives:

The main objective of this paper is to assess the knowledge and perception of schoolteachers about food allergy.

Methods:

A cross sectional study was conducted among a sample of 360 school teachers between May 2013 and February 2014 in province of Jazan in Saudi Arabia, using a validated web-based self-administered survey.

Results:

The results revealed that almost (59.7%) of the schoolteachers had a medium insufficient knowledge about food allergy; only 17.3% had good knowledge about food allergy. Female teachers had higher knowledge scores (58.5 ± 17.2) as compared to male (51.8 ± 16.0) with statistically significant difference ($p = 0.017$). The majority of schoolteachers have a significantly poor knowledge in most of food allergy domains. More than half of responders either do not know or they disagree that the food allergy is a serious problem and can lead to death. Regression analysis revealed that participant's level of knowledge is significantly associated with school teacher's attitudes towards food allergy (OR = 0.06, 95% CI: 0.39 - 0.92, $p = 0.01$), practice (OR = 1.68, 95% CI: 1.11 - 2.56, p = 0.01), and years of experiences (OR = 1.8, 95% CI; 1.15 - 2.98, $p = 0.011$).

Conclusion:

Knowledge of food allergy among schoolteachers is not adequate, failing to recognize and treat fatal food allergy reactions necessitate an urgent need to set a school policy to improve the food allergy situation.

Keywords: Food allergy, Schoolteachers, Jazan province, Saudi Arabia, School policy, Skin rash, Hives.

1. INTRODUCTION

Food allergy is a common problem in children as well as in adults, and its prevalence is well discussed and estimated in developed countries [1]. There is a significant gap in estimating the prevalence of food allergy in developing countries and particularly in Middle East Arabian Countries [2].

Food allergy is an abnormal immune body reaction to some food contents, the symptoms of reaction usually present as an immediate presentation, but some time can be late. Skin rash and hives usually are the main presentations [3].

* Address correspondence to this author at the Department of Pediatrics, Faculty of Medicine, Jazan University, Gizan 45142, Kingdom of Saudi Arabia; Email: dr.gassem@gmail.com

When two systems are involved in the reaction (skin, cardiovascular, respiratory or gastrointestinal) then it is termed as anaphylaxis [4]. Anaphylaxis is a serious medical problem leading to food allergic reactions [5] and requiring a prompt treatment [6].

Food allergy can be a serious and fatal illness [7]. Severe fatal food allergy reaction at school is rare but have been reported [8]. Safety and management of food allergy reaction is an issue that is gaining increasing attentions [9] and mainly the problem of school preparedness [10]. Nearly all schools in developed countries are supplemented with food allergy guidelines [11, 12].

To our knowledge there is no written policy or guideline existing at our schools in Saudi Arabia about food allergy precaution and management. There is no previous study estimating the prevalence of food allergy either in Jazan region or in Saudi Arabia. Some studies estimate the rate of food allergy in other atopic diseases [3, 4] but not for general population. The current study aims to assess the knowledge of schoolteachers about food allergy and to determine the need for urgent strategic plan in order to set up a policy and procedure for ensuring wellbeing of children in their schools.

2. MATERIALS AND METHODS

2.1. Study Design, Area and Participants

An observational cross-section study was conducted in Jazan Province during the period between May 2013 and February 2014. The province is located in the southwest corner of Saudi Arabia and lies on the western coast of the Red Sea. The population is estimated at 2365110 according to the latest population census. The study population was schoolteachers of Jazan province. The inclusion criteria included teachers currently working at governmental schools belonging to Jazan educational administration during the academic year 2013/2014.

2.2. Study Instrument

A validated previously published questionnaire was used for data collection purposes [1]. Two independent translators who were well versed in both languages and are associated with health services validated the Arabic translation. The questionnaire consists of four parts; a knowledge section to address identification of food allergies, the risk and the causes, the practice section includes what teachers will do in case of food allergy, and the attitudes section was devoted to feelings towards children with food allergy. The last section of the questionnaire covered a set of sociodemographic questions.

2.3. Data Collection Technique and Sampling Procedures

The questionnaire was uploaded onto a website and the link of the questionnaire was distributed to different selected schools. Schools were randomly selected from the different educational sectors of Jazan to ensure the optimal population representation. A sample of 500 participants was estimated for the purpose of this study. The sample size was calculated using the formula for a single cross-sectional survey, $n = [(z^2 * p * q)]/d^2$. The sample size was calculated using the following parameters: p = prevalence of food allergy knowledge = 50%, Z = 95% confidence interval, d = error ≤ 5%, and a 25% non-response rate.

2.4. Statistical Analysis

All the collected data was analyzed using SPSS version 20. Descriptive characteristic of the studied sample was evaluated by determining the percentages and mean ± Standard Deviation (*SD*). Itemized knowledge, attitude and practice of the teachers about food allergy were calculated. Mean and *SD* of the knowledge scores was determined. Based on the mean and *SD,* the knowledge was categorized into three categories. Good knowledge was determined by scores greatest than (mean + *SD*), Intermediate knowledge (scores between Mean - *SD*) and poor knowledge (scores less the mean – *SD*). Students ***t*** test and one-way ANOVA was used to compare mean knowledge scores. For logistic regression analysis, the teachers who scored above the mean value were termed as high and the teachers who scored equal or below the mean were termed as low. After the dichotomous categorization regression was performed keeping knowledge (high/low) as the dependent variable. A ***p*** value less than 0.05 was used to indicate statistical significance (Table **1**).

Table 1. Knowledge score about food allergy according to some selected characteristic.

Characteristic	Knowledge Scores			Mean Score ± SD	*p*. Value
	Low	Moderate	Good		
Gender (*n*=300)					
Male	16(36.4)	24(54.5)	4(9.1)	51.8± 16.0	0.017*
Female	53(20.7)	155(60.5)	48(18.8)	58.5± 17.2	
Age Groups (*n*=299)					
18-24	1(8.3)	9(75.0)	2(16.7)	60.0±12.8	0.186#
25-44	62(24.2)	154(60.2)	40(15.6)	56.8±17.2	
45+	6(20.0)	14(46.7)	10(33.3)	62.7±18.4	
Years of Experience (n=298)					
Less than 5 years	15(31.3)	25(52.1)	8(16.7)	55.2±18.6	0.166#
5-10 years	37(19.4)	117(61.3)	37(19.4)	55.0±16.0	
More than 10 years	16(26.7)	37(61.7)	7(11.7)	59.0±17.1	
Past Experience with Food Allergy					
No	35(28.0)	65(52.0)	25(20.0)	57.1± 18.9	0.818*
Yes	35(20.1)	112(64.4)	27(15.5)	57.6± 16.1	
Over all (*n*=300)	**69(23.0)**	**179(59.7)**	**52(17.3)**	**57.2**±17.6	

* Based on t test

Based on one-way ANOVA

3. RESULTS

The response rate was estimated at 72% (360 out of 500). The distribution of study participants according to gender showed 13% were males and 83% were females. Some of the subjects (nearly 4%) did not reveal their gender. The distribution of the subjects according to different age categories showed that majority of them 81.1% belong to the age group 25-44 years. Nearly 95% of the study populations were Saudi nationals indicating a homogenized study sample (table not provided).

The total scores were computed and classified, as mentioned in the methodology section. Moreover, the overall mean score of food allergy was presented. As shown in Table **2**, most teachers (59.7%) have intermediate food allergy knowledge (overall mean = 57.2, *SD* = 17.6). No significant difference was found between food allergy scores of the study participants according to age groups, years of education past years of experiences with food allergy and or college type (p = 0.186, and 0.166 and 0.818 respectively). The mean scores are significantly higher for female than in males (58.5± 17.2 and 51.8± 16.0 respectively $\boldsymbol{p}$ = 0.017).

Table **2** presents itemized knowledge of schoolteachers about food allergy. According to the table More than half of responders either do not know or they disagree that the food allergy is a serious problem and can lead to death. One third of study participants reported that food allergy means food is harmful. The majority of teachers do not have much idea about the common food are causing allergy. Around 60% of responders were able to recognize the immediate reaction from food allergy, 80% of them were aware about the skin rashes as a common presentation of food allergy.

Table 2. Itemized knowledge of tutors in relation to known subjects suffering from food allergy.

Item from Questionnaire	Correct Scores n(%)
Food allergy means food is harmful	113(31.4)
Lactose intolerance is it a food allergy	78 (21.7)
Death can be result of food allergy	133 (36.9)
Skin rashes is a common presentation of food allergy	286(79.4)
Allergic reaction after food touching	195(54.2)
Low Fat Milk causes food allergy	114(31.7)
Mother food transfer to breast milk to her child	266(73.9)
Acidic food causes food allergy	204(56.4)
Allergic disease run in the families	139(8.6)
Outgrow of food allergy	132(36.7)
Food allergy common in children than adult	211(58.6)
Food allergy incidence Increasing	152(42.2)

(Table 2) contd.....

Item from Questionnaire	Correct Scores n(%)
Food allergy cure Exists	289(80.3)
Only to prevent food allergy is to stay away from that food	289(80.3)
Taking everyday medicine can prevent food allergy	110(30.6)
Law in Saudi for Labeling food allergy	140(38.9)
Having an Epi-Pen (injectable epinephrine) is an important for most children with sever food allergy	100(27.8)
Most common allergic (peanut/peanut butter)	130(35.0)
Most common allergic (tree nuts almonds walnuts)	0(0.0)

Table **3** displays itemized attitude of schoolteachers towards food allergy. According to the table around 60% of study participants disagree that Children with food allergies are teased at school, while 83.4 agree that It is difficult for people with food allergies to safely eat at restaurant. Regarding the School should have plans for keeping children with food allergies safe at school majority or 99% of them agree with this statement. Majority of study participants 82.8% stated that Special places for food allergic students might be good practice for children with food allergy. Moreover 61.7% of schoolteacher agree that it is unfair to band a food because some student allergic to it (Table **4**).

Table 3. Itemized attitude of tutors towards food allergy.

Item	Agree	Neutral	Disagree
Children with food allergies are teased at school	105(40.1)	2(0.8)	155(59.2)
It is difficult for people with food allergies to safely eat at restaurant	251(83.4)	0(0.0)	50(16.6)
Children with food allergy having over protective parent	250(85.9)	2(0.7)	39(13.4)
People with food allergies worry a lot about their allergy	278(93)	1(0.3)	20(6.7)
For allergic children it is not easy to keep away from food that causes allergy	235(79.9)	1(0.3)	58(19.7)
School should have plans for keeping children with food allergies safe at school	324(98.8)	0(0.0)	4(1.2)

Table 4. Itemized practice of tutors in relation to known subjects suffering from food allergy.

Item from Questionnaire	Anyone with Allergy*		% Correct Scores (n)
	Yes (%)	No (%)	
Ban nuts at school			36.7% (132)
Agree	53.5	47.3	
Disagree	37.8	45.1	
I don't know	8.7	7.7	
Special places for food allergic students			82.8% (298)
Agree	86.2	90.1	
Disagree	10.1	7.7	
I don't know	3.6	2.2	
Unfair to band a food because some student allergic to it			61.7% (222)
Agree	66.1	68.1	
Disagree	24.3	24.2	
I don't know	9.6	7.7	
Worry of having student has food allergy in the class			56.9% (205)
Agree	63.4	53.7	
Disagree	28.2	38.9	
I don't know	8.4	7.4	

** No significant difference was reported between the two groups for all table items*

Table **5** illustrates the results of the logistic regression analysis. The analysis shows that participant level of knowledge is significantly associated with school teacher's attitudes (OR= 0.06, 95% CI; 0.39 – 0.92, p = 0.01), practice (OR =1.68 95% CI: 1.11- 2.56 p = 0.01), and years of experiences (OR= 1.8, 95% CI; 1.15-2.98 p = 0.011).

Table 5. Relation between participant's knowledge and some selected factors.

Variables	*p.* value*	COR	95% C.I.
Attitude	0.019	0.60	0.39 - 0.92
Practice	0.014	1.68	1.11- 2.56

(Table 5) contd.....

Variables	*p.* value*	COR	95% C.I.
Gender (male)	0.062	1.86	0.97-3.56
Knowing anyone with allergy (No)	0.212	1.34	0.84-2.12
Years of Experiences (Less than 10 years)	0.011	1.85	1.15-2.98
Age (Less than 45 years)	0.284	1.53	0.70-3.34)

*Level of knowledge is the dependent variable

4. DISCUSSION

To our knowledge this is the first study in Saudi Arabia conducted on food allergy knowledge, attitudes, and beliefs among school teachers. We believe that the schoolteachers are an important population segment in any country, and we proposed that the assessment of their awareness about food allergy would weigh the magnitude of problems and help students suffering from food allergy.

We found that schoolteachers have a significant poor knowledge in most of food allergy domains. More than half of responders either do not know or they disagree that the food allergy is a serious problem and can lead to death. The majority of teachers do not have much idea about the common food causing allergy and as we know that peanut and nuts are known to be the top listed foods that cause fatal reaction [13] but, here in our study 100% responded nut as not a food allergy causing substance. 65% of responders felt the same for peanut, and that could highlight the rarity in knowledge of these food causing allergy substances in our community. Around 60% of responders were able to recognize the immediate reaction from food allergy, 80% of them aware about the skin rashes as a common presentation of food allergy. However, a frequent misconception that food allergy is a cause of chronic nasal congestion was a finding in our study [14].

Milk allergy is related to milk proteins [15] and 70% of participants responded incorrectly to low fat milk causing food allergy. 80% considered lactose intolerance as a form of food allergy. There is a significant lack of knowledge about incidence and daily treatment of food allergy in face of a lot of hope in finding a cure. Our major concern is the poor knowledge about the main stay of treatment of severe form of food allergy which is the Epinephrine auto-injector [16, 17].

To the best of our knowledge there is no policy to keep Epinephrine auto-injector in the school in Saudi Arabia, having this treatment in the school and training on how to use it, mandate a clear legislation [18], and we hope that this study will bring a positive change leading to such action. School teachers agree on having a safety plan for children with food allergy, but 70% of them do not believe that students with food allergy can be teased because of this problem [19]. The participants were mostly aware about the avoidance as the only prevention of food allergy [20] and they feel in 65% how difficult is staying away from offending food, there is a current food labeling law in Saudi Arabia [21], but more than half of responders are not aware of it. Majority of teacher felt worry about having student with food allergy in their class, with some concern of inability to recognize early reaction of incidental ingestion of the offending food.

5. LIMITATIONS

This study has several limitations, first, is the ratio of male responders to females are not reflecting the actual school teacher's population, this was due to the high non-response among male teachers compared to female teachers. The web-based survey is a valid and reliable means of data collection, but it has some limitations like high nonresponse rate [1]. Second the study was based on a cross-sectional study design, so study results should be understood in this context.

CONCLUSION

In conclusion, participants of our study showed significant poor basic knowledge of food allergy, there is a major concern of fatal reaction recognition as result of incidental ingestion of food causing allergic reaction, importance of epinephrine auto-injector as the main treatment of sever food allergy is not well acknowledged by school teachers, our finding put safety of children with food allergy in the school as a top urgent topics to be discuss with authorities to introduce a policy regarding food allergy in the schools along with educational intervention and action plan that ensure the optimal treatment of food allergy in case of severe and fatal reaction. We recommend keeping epinephrine auto-injector in the school with teaching on how and when to use it [22].

AVAILABILITY OF DATA AND MATERIALS

The datasets used and/or analyzed during the present study available from the author on reasonable request.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study instruments and protocols were approval from the IRB committee of the faculty of Medicine, Jazan University.

HUMAN AND ANIMAL RIGHTS

No animals/humans were used for studies that are the basis of this research.

CONSENT FOR PUBLICATION

Voluntary informed consents were signed from all subjects who accepted to be enrolled in the study.

CONFLICT OF INTERESTS

The authors declare no conflict of interest, financial or otherwise.

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