

Original Research Article

Knowledge and practices regarding anaphylaxis management in children and adolescents among teachers in KSA**Khalid Ayed Asiri¹, Syed Esam Mahmood^{2*}, Sama Ahmad Allostath³, Manal Dhyem Alshammari⁴, Thamer Ahmed Al Sayari⁵, Ausaf Ahmad⁶, Safar A. Alsaleem⁷**¹*College of Medicine, King Khalid University, Abha, Saudi Arabia*²*Department of Family & Community Medicine, College of Medicine, King Khalid University, Abha, Kingdom of Saudi Arabia (KSA)*³*College of Medicine, Bateria Medical College Jeddah, Saudi Arabia*⁴*College of Medicine, Aljouf University, Aljouf, Saudi Arabia*⁵*College of Medicine, Bateria Medical college, Jeddah, Saudi Arabia*⁶*Department of Community Medicine, Integral Institute of Medical Sciences & Research Integral University, Lucknow, Uttar Pradesh, India*⁷*Department of Family & Community Medicine, College of Medicine, King Khalid University, Abha, Kingdom of Saudi Arabia (KSA)***Received: 15-11-2020 / Revised: 22-12-2020 / Accepted: 14-01-2021****Abstract**

Introduction: Anaphylaxis is a common emergency and a serious allergic reaction that can be life threatening. School going children are prone to many allergic reactions and the knowledge and practices of teachers regarding these reactions and their management is poor. The literature is scarce regarding the school teachers' awareness of anaphylaxis in KSA, therefore this study was undertaken to assess the awareness of anaphylaxis among teachers in Saudi Arabia and to assess their knowledge and practices in anaphylaxis management among school going children. **Material and Methods:** This six month cross-sectional study was conducted among randomly selected Saudi teachers working in different regions of the Kingdom. The knowledge and attitude about their role in anaphylaxis management among students was assessed. Data was collected through self-administered electronic questionnaires and analyzed by using SPSS software version 22.0. **Results:** Out of 384 Saudi teachers the majority was middle aged and was women. Nearly 26.8% of the respondents had witnessed a student suffering from anaphylaxis. Majority (60.9%) of teachers hadn't any awareness about anaphylaxis. In terms of the first administered drug in case of anaphylaxis, 25.3% teachers reported that they would use an antihistamine, whereas 16.4% reported that they would use epinephrine injection. Majority of the teachers (77.3%) did not know the proper route of epinephrine administration, which is intramuscular injection. Only 15.4% teachers had knowledge of epinephrine as a medication and 37.2% were aware of the administration method of self-injection using an Epinephrine. Furthermore, 17.4% informed that there was an action plan in their school in cases of anaphylaxis, and 11.7% reported that their school had an first aid medicine in case of an anaphylactic reaction. **Conclusion:** The knowledge and practices of Saudi teachers regarding anaphylactic reactions need to be strengthened. Teachers need further education regarding the management of allergic reactions encountered among students

Keywords: Anaphylaxis, reaction, Teachers, Knowledge, practices

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Introduction

Anaphylaxis is a common emergency and a serious allergic reaction that can be life threatening.[1].The frequency of anaphylaxis is approximately 50–2000 episodes/persons 100,000 and has a lifetime prevalence of 0.05–2.0%.[2]. Allergic reaction is a most commonly encountered health issue among children[2,3] Between 10% and 18% of children with history of food allergy experience various allergic reactions to food, including anaphylaxis at school [4-6]. Multisystem manifestations occur due to the rapid release of inflammatory mediators. In children, foods can be a significant trigger for immunoglobulin E(IgE)-mediated anaphylaxis. Anaphylaxis can happen in people having Allergies, Asthma and a family history of

Anaphylaxis. Most clinical presentations of anaphylaxis is a systemic syndrome involving stridor, wheezing or hypotension, skin itching, urticaria, angioedema, erythema. In absence of treatment, the reaction may rapidly progress with increasingly severe manifestations with a potentially fatal outcome [7].Most children spend most of their time in school, so they are prone to many allergic reactions. So teachers are often the first individuals to deal with situations requiring first aid and medical emergencies. The knowledge and practices of Saudi teachers regarding anaphylactic reactions are reported to be poor[8].The literature is scarce regarding the school teachers' awareness of anaphylaxis in KSA. With the above background this study was undertaken to assess the awareness of anaphylaxis among teachers in Saudi Arabia and to assess their knowledge, attitude and practice in anaphylaxis management.

Material and Methods

Study design: This cross-sectional study was conducted among Saudi teachers to assess the knowledge, confidence and attitude about their role in anaphylaxis management.

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Study area: This study was conducted in all regions of Saudi Arabia.

Study period: Six months from 15/01/2020 – 15/06/2020

Sampling technique: Participants for this study were selected by convenient nonrandom sampling technique.

Inclusion criteria: Any Saudi teacher willing to participate was included in the study.

Exclusion criteria: Individuals who were not teachers were not included.

Data collection: Data was collected through self-administered electronic questionnaires. The questionnaire contained the Socio-

demographic characteristics of participants, Statement of teacher's knowledge of anaphylaxis and Statement of teacher's practical knowledge of statement anaphylaxis.

Data analysis: After filling the questionnaire, they will be collected, and analyzed by using (SPSS) software version 22.

Ethical consideration: This study was approved by institutional ethical committee before implementation.

Informed consent: Informed consent was taken from all participants. All the information obtained was kept confidential.

Result

Table 1: Sociodemographic characteristics of participants Study data n(%) (n =384)

Study group	n(%)
Age group in years	
0-25	26(6.8%)
26-35 years	81(21.1%)
36-45 years	185(50.4%)
>45 years	92(14.3%)
Sex	
Male	73(19.0%)
Female	311(81.0%)
Which region the school belongs to?	
Central region	57(14.8%)
Eastern region	18(4.7%)
Northern region	151(39.3%)
Southern region	57(14.8%)
Western region	101(26.3%)
Educational level	
Secondary	12(02.5%)
Diploma	78 (16.4%)
University	370(77.7%)
Master degree	16 (03.4%)
School level taught	
B.A.	347(90.36%)
Diploma	17(4.43%)
High school	3(0.78%)
Master	15(3.91%)
Phd	2(0.52%)
School level taught	
High school	129(33.6%)
Middle school	105(27.3%)
Primary school	150(39.1%)
Specialty	
Arabic language	67(17.4%)
Science	90(23.4%)
Math	38(9.9%)
English	46(12.0%)
Islamic studies	52(13.5%)
Others	91(23.7%)
Years of service in education	
0-10 years	134 (34.9%)
11-15 years	49(12.8%)
>15 years	201(52.3%)
Had witnessed students suffering from anaphylaxis	
Yes	103(26.8%)
No	225(58.6%)
May be	56(14.6%)

Table 1 shows the socio-demographic characteristics of 384 Saudi teachers. The age range was from above 20 up to maximum age 59 years old, and the majority was in the middle age group (36-45 years). Majority of the respondents were women. Most of the

respondents have university level. Above 90 percent respondents were teaching B.A. Specialty of the respondents were science followed by Arabic. Moreover, 26.8% of the respondents had witnessed a student suffering from anaphylaxis.

Table 2: Statement of teachers' knowledge of anaphylaxis

Statement	n (%) (n=384)
K1. Knowledge of any of students with anaphylaxis	
Yes	82(21.4%)
No	246(64.1%)
May be	56(14.6%)
K2. Aware of anaphylaxis	
Yes	93 (24.2%)
No	234(60.9%)
May be	57(14.8%)
K3. Knowledge about the symptoms of anaphylaxis	
Yes	93(24.2%)
No	235(61.2%)
May be	56(14.6%)
K4. Substances that can cause anaphylaxis†	
Drugs	231(60.2%)
Insect sting	138(35.9%)
Seafood	172(44.8%)
Pollen	145(37.8%)
Nuts	140(36.5%)
I don't know	7(1.8%)
K5. Sport activities may be considered one of the causes of anaphylaxis	
Yes	24(6.2%)
No	228(59.4%)
I don't know	132(34.4%)
K6. Rubber products, such as Gauntlet, are one cause of anaphylaxis	
Yes	119(31.0%)
No	68(17.7%)
I don't know	197(51.3%)
K7. Common foods that can cause anaphylaxis†	
Eggs	297(77.3%)
Nuts	140(36.5%)
Bananas	186(48.4%)
Seafood	184(47.9%)
Strawberries	121(31.5%)
K8. First aid that must be performed in cases of anaphylaxis	
Give epinephrine injection (Epipen)	27 (7.0%)
Tell His/Her family to take him/her to the hospital	78(20.3%)
Call ambulance service	118(30.7%)
Performed CPR	7(1.8%)
Antihistamines injection	33(8.6%)
I don't know	121(31.5%)
K9. Initial drug that should be used in case of anaphylaxis#	
Analgesics	24(6.2%)
Antihistamine	97(25.3%)
Drugs	3(0.8%)
Epinephrine	63(16.4%)
I Dont Know	197(51.3%)
K10. Route of epinephrine administration as initial	
Intramuscular	36(9.4%)
Intravenous	24(6.2%)
Subcutaneous	27(7.0%)
I Don't Know	155(40.4%)

†Variable with multiple responses.

Table 2 illustrates that the knowledge of teachers regarding anaphylaxis. Only 21.4% have knowledge of any of students with anaphylaxis. Majority of teachers haven't any awareness about anaphylaxis. The most common substances reported to cause anaphylaxis were drugs (60.2%), followed by seafoods (44.8%). Only 6.2% percent known that sport activities may be considered one of the causes of anaphylaxis. Furthermore, the teachers believed that the most common foods triggering anaphylaxis were eggs (77.3%)

and bananas (48.4%). In cases of anaphylaxis, the most common first aid action that would be carried out by the teachers in our study was to call ambulance service (30.7%); only 7.0% of teachers would consider administering epinephrine injection. In terms of the first administered drug in case of anaphylaxis, 25.3% of the teachers reported that they would use an antihistamine, whereas 16.4% reported that they would use epinephrine injection. Once questioned about the proper route of epinephrine administration, majority of the teachers in present study (77.3%) did not know, and only 9.4 % choose the suitable method, which is intramuscular injection.

Table 3: Statement of teachers' practical knowledge of anaphylaxis

P1. Have you ever heard of epinephrine as a drug?	
Yes	59(15.4%)
No	325(84.6%)
P2. Have you ever heard before about self-injection (Epipen)?	
Yes	143(37.2%)
No	241(62.8%)
P2.1 If yes, do you have knowledge of self-injection (Epipen) ‡	
Yes	56(39.2%)
No	87(60.8%)
P3. In cases of anaphylaxis: is there an action plan in your school?	
Yes	67(17.4%)
No	169(44.0%)
I don't know	148(38.5%)
P4. Are first-aid medicines for anaphylaxis available in your school?	
Yes	45(11.7%)
No	184(47.9%)
I don't know	155(40.4%)

‡ Only 143 teachers had heard about self-injection and were included in the analysis. Table 3 depicts about the statement of teachers' practical knowledge of anaphylaxis. Practical viewpoint of teachers, 84.6% teachers never heard of epinephrine as a drug. Only 15.4% teachers had knowledge of epinephrine as a medication and 37.2% were aware of the administration method of self-injection using an Epinephrine. Furthermore, 17.4% informed that in cases of anaphylaxis, there an action plan in your school and 11.7% reported that their school had an first aid medicine in case of an anaphylactic reaction.

Discussion

School-age children are at higher risk of developing an anaphylactic reaction.[9,10] Anaphylaxis arises annually in 30 of 100,000 people in the United States of America, with a stated death rate of 1-2%.[11] and it is projected that one in 10,000 children has an anaphylactic reaction each year, about 82% of which occur in school-age children.[12] In this study, we assessed teachers' knowledge, awareness, and attitudes toward anaphylaxis. Our results presented that 26.8% of the respondents had witnessed a student suffering from anaphylaxis. The European Academy of Allergology and Clinical Immunology emphasize the importance of the school personnel's knowledge in recognizing and providing first aid measurement for children with an allergic reaction and others.[13-15] Only 21.4% have knowledge of any of students with anaphylaxis in this study. In another study by Ercan et al, fifty-two percent of the teachers knew which students had an allergic disease.[16] Majority of teachers did not have any awareness about anaphylaxis. The most common substances reported to cause anaphylaxis were drugs (60.2%), followed by seafoods (44.8%) in the present study. Whereas another study showed that the most common substances reported to cause anaphylaxis were insect stings (54.4%), followed by nuts (54.2%)[8]. This is comparable to the study findings of Ercan et al where, the most significant causes were thought to be pollen by 54% of the teachers, food by 47%, mites by 40%, and drugs by 30%.[16] Only 6.2% percent known that sport activities may be considered one of the causes of anaphylaxis in the present study. Similar finding reported by Alsuhailani et al that only 8% percent believed that sport activities could cause anaphylaxis. Furthermore, the teachers believed that the most common foods triggering anaphylaxis were eggs (77.3%) and bananas (48.4%).[8] In present study, the most common first aid action that would be carried out by the teachers in our study was to call ambulance service. Whereas Alsuhailani et al reported that Knowledge about first aid to perform during an anaphylactic event is crucial and the most common initial reaction of teachers towards an anaphylactic event would be to tell to the child's family and to call for an emergency ambulance[8] Ercan et al. showed that the most common initial step in cases of anaphylaxis was to

notify the nurse, who would then administer first aid[16] In contrast, Dumeier et al. published a study based on a 4–12-week educational session for preschool teachers addressing allergies, anaphylactic emergencies, and administering auto-injectors[17]. While present study showed that only 7.0% of teachers would consider administering epinephrine injection. In terms of the first administered drug in case of anaphylaxis, 25.3% of the teachers reported that they would use an antihistamine, whereas 16.4% reported that they would use epinephrine injection. Anaphylaxis is a serious condition needs early diagnosis and evidence-based guidelines suggest that immediate epinephrine administration should be the first line of treatment for an anaphylactic episode[18,19] In schools, the patient, school nurse, teacher, and other trained school staff may use an epinephrine auto-injector. Practical viewpoint of teachers, 84.6% teachers never heard of epinephrine as a drug. Only 15.4% teachers had knowledge of epinephrine as a medication. In addition, Epinephrine is the first-line treatment in the acute management of anaphylaxis[20] Studies have indicated that 16-18% of children with food allergies have a reaction after accidentally ingesting foods.[21,22] Nearly 25% of reported serious and life threatening reactions in school occur in children without prior food allergy diagnosis.[22,23]

Conclusion

The knowledge and practices of Saudi teachers regarding anaphylactic reactions need to be strengthened. Teachers need further education regarding the management of allergic reactions encountered among students

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