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Determination of Teachers' Food Allergy and Anaphylaxis Management Self-Efficacy and Knowledge Levels

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Abstract

Introduction: This study aims to determine teachers' food allergy and anaphylaxis management self-efficacy and knowledge levels.

Methods: This descriptive study was conducted with 399 teachers who worked in kindergarten and primary schools in a city center between March and June 2022. Data were collected through the Descriptive Characteristics Form and the Food Allergy and Anaphylaxis Management Self-efficacy Scale for School Personnel. Data were analyzed in SPSS statistical program (version 18) using descriptive statistical analyses, the Kolmogorov-Smirnov analysis, the Mann-Whitney U test, the Kruskal-Wallis test, and the Spearman correlation analysis. Statistical significance was accepted $P<0.05$.

Results: The mean age of participating teachers was 31.18± 6.79 years, and 67.2% (n=268) were females, 61.9% (n=247) were married, 63.7% (n=254) were classroom teachers, and 56.6% (n=226) did not have children. Teachers' Food Allergy and Anaphylaxis Management Self-Efficacy Scale mean score was 21.21±6.22. Food allergy and anaphylaxis management self-efficacy was higher in kindergarten teachers, teachers who had a student with food allergy, those who received first aid education after starting to work, those who think that food allergy and anaphylaxis management in school is the teachers' duty, and those who wanted to know about food allergy and anaphylaxis management. Teachers with low self-efficacy felt/would feel most frequently panic while managing a child with food allergy ($P<0.05$).

Conclusions: Teachers were found to have an inadequate level of food allergy and anaphylaxis management self-efficacy. Teachers who worked with little children, who received first-aid education, who had students with food allergy diagnosis, who wanted to be proficient on this issue and who saw this as a duty; namely who had awareness about the issue had higher food allergy and anaphylaxis management self-efficacy.

INTRODUCTION

Food allergy is defined as reactions with immunologic mechanisms that cause immigulabin E (IgE) mediated diseases [1]. The deterioration in the clinic and immunologic tolerance against the food eaten also causes anaphylaxis reactions that have negative effects on health and threaten life [1]. The prevalence of food allergy has demonstrated an increase in recent years. Food allergy has also been acknowledged as an important public health problem worldwide, particularly with the increase in allergic rhinitis and asthma diseases within the last years of the 20th century [2].

Significant symptoms of food allergy include skin problems, rash, itching, respiratory problems, cough, wheezing, nasal obstruction, and gastrointestinal system and cardiovascular diseases [3]. Besides, hypovolemic shock and angioedema, which are known as anaphylaxis and threaten life in its most severe form, are also encountered [4]. Anaphylaxis is a severe and systemic hypersensitive reaction that starts suddenly, progresses rapidly, may result in death, and requires emergency

intervention [5]. Therefore, early diagnosis and treatment are highly important for decreasing rates of morbidity and mortality that can be caused by anaphylaxis.

Cows' milk, eggs, wheat, hazelnut, peanut, soya, cashew nut, fish, strawberry, and shellfish are among the food that can cause allergy most commonly. Apart from these food types, any nutrients can cause allergy [6]. It is reported that compared to adults, children are affected by food allergy more and that food allergy has increased rapidly in recent years among children [7, 8].

Children spend the majority of their time in school environments. A school is a place where children contact various types of foods. Hence, schools and kindergartens are the most common places where anaphylaxis develops [9]. The prevalence of food allergy is reported to be 6-12% in school-age children [10]. Of these allergic reaction cases, 23% happened in kindergartens (0-6 years) 30% happened in primary schools (7-11 years), 28% happened in secondary schools (12-16 years). The probability of food allergy was considered for 92% of the 60 allergic reactions observed [11]. Food allergy and anaphylaxis management in schools has become an important issue with the common prevalence of anaphylaxis reactions in children [12] Besides, in their study conducted with teachers, Dumeier et al (2018), Alsuhaibani et al (2019), GonzalezMancebo et al (2019) found that teachers did not know children with food allergy; most schools did not have treatment medicine for anaphylaxis; and teachers did not have adequate knowledge about anaphylaxis [13-15].

In developing countries where school nurses or health professionals are limited in number, teachers are individuals who communicate with children all day, which puts the biggest responsibility about food allergy and anaphylaxis management on their shoulders. Therefore, teachers need to have adequate knowledge and equipment to manage food allergy and anaphylaxis cases. In this regard, this study aims to determine teachers' food allergy and anaphylaxis management self-efficacy and knowledge levels.

METHODS

This descriptive study was conducted in kindergartens and primary schools in a city center located in eastern Turkey between March and June 2022. The target population of the study was 1200 teachers who worked in kindergartens and primary schools in the related city center. The sample size was calculated as 291 individuals using the sampling method with a known population [16], and the study was conducted with 399 teachers who agreed to participate in the study.

Inclusion Criteria: The study included teachers who worked actively during the time the study was conducted and who agreed to participate in the study.

Ethical Considerations

Before the study was conducted, ethics committee approval was obtained from the Scientific Research Ethics Committee of the university (ethics committee approval dated 26.05.2021 and numbered E.9659). Teachers who agreed to participate in the study were given information about the study, and their verbal consent was received. Written permission was obtained from the authors for the scales utilized in the study.

Measurements

Data were collected through the Descriptive Characteristics Form and the Food Allergy and Anaphylaxis Management Self-Efficacy Scale for School Personnel.

Descriptive Characteristics Form: The form developed by the researchers was composed of 24 questions regarding teachers' descriptive characteristics and their experiences and knowledge about food allergy and management [17, 18].

Food Allergy and Anaphylaxis Management Self-Efficacy Scale for School Personnel (FAAMSESSP): The scale developed by Polloni et al. [19] assesses school personnel's (teacher, caregiver, health personnel, etc.) perceived self-efficacy about food allergy and anaphylaxis management skills in a school environment. The Likert-type scale is composed of eight items and two sub-scales (Self-efficacy in Food Allergies Management-FAM and Anaphylaxis Management-AM). Total scores obtained from the items range between 8 and 40, with higher scores indicating high self-efficacy levels. The AM scale had a Cronbach's alpha of 0.85 and the FAM scale had a Cronbach's alpha of 0.75 [19]. Reliability and validity of the Turkish form were performed by Haney et al [18]and Cronbach's alpha value was found 0.91 [18], Cronbach's alpha value was found to be 0.87 for the total scale, 0.77 for the AM sub-scale, and 0.86 for the FAM subscale of this study.

Data collection/Procedure

Data were collected after permission was obtained from teachers who agreed to participate in the study via self-report. The link, which was prepared electronically and contained the scale questions, was sent to the participants online via telephone so that they could answer the questions.

Data Analysis

Data were analyzed in SPSS statistical program (version 18) using descriptive statistical analyses (numbers, percentages, and means), histogram, skewness and kurtosis values, and Kolmogorov Smirnov analysis to determine if data were distributed normally. As the data did not distribute normally, the comparison of mean scores in two independent groups was performed using the Mann-Whitney U test; the comparison of more than two independent groups was done using the Kruskal Wallis test; and the relationship between scale mean

scores was done using the Spearman correlation analysis. Statistical significance was accepted P<0.05.

RESULTS

The mean age of participating teachers was 31.18± 6.79, and 67.2% (n=268) were females, 61.9% were married, 56.6% did not have children, 63.7% were classroom teachers, and 95% had bachelor's degree. It was found that 7.8% of teachers had a student with food allergy before, 12.8% had a student with food allergy during the time the study was conducted, 27.5% (n=14) of the students with food allergy had food allergy to more than one food, and 17% (n=68) of schools within the scope of the study provided students with breakfast or lunch. Of all the participating teachers, 98% (n=391) did not receive any trainings about food allergy and anaphylaxis, 52.6% (n=210) did not receive first aid education after starting to work, 58.9% thought that food allergy and anaphylaxis management was not teachers' duty in schools, 40.4% experienced/would experience mostly fear/anxiety while managing a child with food allergy, 59.4% did not know whether their school had an emergency action plan for food allergy and anaphylaxis management in their school, 52.1% did not know if their school had emergency treatment medicine necessary for anaphylaxis management in their school, and 74.4% did not have any students who carried medicine for allergic reactions. It was also found that 82.2% of the teachers wanted to know about food allergy and anaphylaxis management, 77.4% needed to receive education about food allergy, 61.9%stated that the ingredients part was the most critical information to be read in the food label for food allergy, and 49.1% stated that their school had no educated personnel to perform first aid in case of a serious allergic reaction in their school. Of all the teachers, 53.6% did not know the most common symptoms of a student who has food allergy and acute reaction to a specific food, and 27.3% did not know what to do in case of a serious allergic reaction that might develop in their students. The group's Food Allergy and Anaphylaxis Management Self-Efficacy Scale mean score was found 21.21±6.22 (Table 1).

Food Allergy and Anaphylaxis Management Self-Efficacy Scale mean score was found to be significantly higher in those who are kindergarten teachers, who had students with food allergy during the time the study was conducted, who thought that food allergy and anaphylaxis management in school was teachers' duty, and who wanted to know about food allergy and anaphylaxis management (P<0.05). The scale mean score was found to be significantly lower in those who most frequently felt or would feel panic while managing a child with food allergy (P<0.05) (Table 2).

No significant relationships were found between Food Allergy and Anaphylaxis Management Self-efficacy Scale mean score and age and duration of working (P>0.05) (Table 3).

Table 1. Descriptive Characteristics of the Teachers (n=399)

	N	%
Gender		
Female	268	67.2
Male	131	32.8
Marital Status		
Married	247	61.9
Single	152	38.1
Having children		
Yes	173	43.4
No	226	56.6
Area of specialization		
Kindergarten teacher	79	19.8
Classroom teacher	254	63.7
Branch teacher	66	16.5
Education level		
Bachelor's degree	379	95.0
Postgraduate degree	20	5.0
Having a student with food allergy before		
Yes	31	7.8
No	368	92.2
Having a student with food allergy during the time the study was conducted		
Yes	51	12.8
No	258	64.7
I do not know	90	22.6
Food students are allergic to, if any (n=51)		
Egg	9	17.6
Chocolate	6	11.8
Cow's milk	5	9.8
Strawberry	2	3.9
Hazelnut/peanut	2	3.9
Gluten	7	13.7
Food with additives	1	2.0
More than one food	14	27.5
Other	5	9.8
Does your school provide students with breakfast or lunch?		
Yes	68	17.0
No	331	83.0

Have you received training about food allergy and anaphylaxis before?		
Yes	8	2.0
No	391	98.0
Have you received first aid education after you started working?		
Yes	189	47.4
No	210	52.6
Do you think food allergy and anaphylaxis management in school is teachers' duty?		
Yes	164	41.1
No	235	58.9
How did you feel/would you feel most frequently while managing a child with food allergy in school?		
Fear/anxiety	161	40.4
Panic	53	13.3
Helplessness	19	4.8
None	126	31.6
All	40	10.0
Does your school have an action plan for food allergy and anaphylaxis?		
Yes	14	3.5
No	148	37.1
I do not know	237	59.4
Does your school have emergency treatment medicine for anaphylaxis?		
Yes	5	1.3
No	186	46.6
I do not know	208	52.1
Do you have any students who carry medicine for allergic reactions?		
Yes	4	1.0
No	297	74.4
I do not know	98	24.6
Would you like to know about food allergy and anaphylaxis management?		
Yes	328	82.2
No	71	17.8
Do you think you need training about food allergy?		
Yes	309	77.4
No	90	22.6
What is the most critical part a teacher needs to read in a food label to help his/her student with food allergy?		
Ingredients	247	61.9
Other (expiration date, calorie value, storage conditions, etc.)	152	38.1
Is there educated personnel in your school to perform the first intervention in case of a serious allergic reaction?		
Yes	10	2.5
No	196	49.1
I do not know	193	48.4
What is the most common symptom of a student who has food allergy and acute reaction to a specific food?		
Rash	36	9.1
Other (rash, itching, respiratory problems, nausea-vomiting, fever, etc.)	149	37.3
I do not know	214	53.6
What would your first reaction be in case of a serious allergic reaction developing in a student?		
Informing the family	61	15.3
Calling or taking to a health institution (112, emergency, etc.)	120	30.1
Informing the school administration	12	3.0
Consulting someone who knows	15	3.8
Giving his/her medicine	13	3.3
Checking his/her breath	16	4.0
Performing first aid	7	1.8
Other (trying to understand the condition, calming the student, washing his/her hands and face, making him/her vomit, helping to get fresh air, making him/her drink water, etc.)	46	11.5
I do not know	109	27.3
Age, min = 21, max = 63	31.18± 6.79	
Food Allergy and Anaphylaxis Management-Self Efficacy Scale, min = 7, max = 35	21.21±6.22	

Table 2. Comparison of Teachers' Food Allergy and Anaphylaxis Management Self-efficacy Scale Mean Scores according to some Characteristics (n=399)

	N	$\overline{X}$ ±SD	Test Value and Significance
Gender			U=16668.5, p=.412
Female	268	21.06±6.12	
Male	131	21.52±6.43	
Marital Status			U=17995.5, p=.487
Married	247	21.04±6.33	
Single	152	21.49±6.05	
Having children			U=19447.0, p=.929
Yes	173	21.20±6.58	
No	226	21.22±5.94	
Area of specialization			KW=17.294, p=.001
Kindergarten teacher	79	22.92±6.05	
Classroom teacher	254	21.38±5.88	
Branch teacher	66	18.50±6.88	
Education level			U=3628.5, p=.748
Bachelor's degree	379	21.17±6.24	
Postgraduate degree	20	22.00±5.84	
Have you had a student with food allergy before?			U=4887.5, p=.185

Yes	31	22.32±7.51	
No	368	21.11±6.10	
Do you have a student with food allergy now?			KW=10.827, p=.004
Yes	51	22.22±6.54	
No	258	21.64±6.22	
I do not know	90	19.41±5.72	
Have you received first aid training after you started working?			U=16503.0, p=.004
Yes	189	22.04±6.60	
No	210	20.46±5.77	
Do you think food allergy and anaphylaxis management in school is the teachers' duty?			U=13038.5, p=.001
Yes	164	23.29±5.45	
No	235	19.75±6.32	
How did you feel/would you feel most frequently while managing a child with food allergy in school?			KW=10.838, p=.028
Fear/anxiety	161	21.87±5.92	
Panic	53	18.94±5.14	
Helplessness	19	20.42±6.49	
None	126	21.74±6.41	
All	40	20.25±7.34	
Would you like to know about food allergy and anaphylaxis management?			U=9352.5, p=.009
Yes	328	21.63±6.01	
No	71	19.27±6.82	
Do you think you need training about food allergy?			U=13865.5, p=.967
Yes	309	21.25±6.12	
No	90	21.07±6.58	
What would your first reaction be in case of a serious allergic reaction developing in a student?			KW=10.553, p=.228
Informing the family	61	20.33±6.51	
Calling or taking to a health institution (112, emergency, etc.)	120	21.65±6.19	
Informing the school administration	12	20.08±5.81	
Consulting someone who knows	15	21.00±5.69	
Giving his/her medicine	13	21.46±6.56	
Checking his/her breath	16	24.63±4.53	
Performing first aid	7	23.86±5.24	
Other (trying to understand the condition, calming the student, washing his/her hands and face, making him/her vomit, helping to get fresh air, making him/her drink water, etc.)	46	21.59±5.10	
I do not know	109	20.50±6.75	

Table 3. Relationship between Food Allergy and Anaphylaxis Management Self-efficacy Mean Score and Age and Duration of Working

	Food Allergy and Anaphylaxis Management Self-efficacy Scale
Age	
r	-.045
p	.371
Duration of working as a teacher	
r	-.062
p	.219

DISCUSSION

This study aims to determine teachers' food allergy and anaphylaxis management self-efficacy and knowledge levels. When the lack of school health nurses in most schools and the increasing prevalence of food allergy among school-age children are considered, it is important to determine teachers' knowledge levels about food allergy and anaphylaxis management. Knowledge alone is not an adequate factor to tackle a problem and succeed; self-efficacy should also be high. Individuals with high self-efficacy aim to take an action by demonstrating high efforts for solution-seeking [19, 20].

This study found that kindergarten teachers had higher food allergy and anaphylaxis management self-efficacy. In their study that provided teachers teaching at different levels with training on allergy and anaphylaxis, Polloni et al. (2020) also found that kindergarten teachers' anaphylaxis management self-efficacy scores were higher [11]. The majority of kindergarten students' meals are completed at school, which is considered to affect teachers' food allergy and anaphylaxis management self-efficacy.

This study found that teachers have inadequate knowledge about food allergy and anaphylaxis management. In their studies in which they measured teachers' food allergy and anaphylaxis knowledge levels and attitudes, Canon et al (2019), Alsuhaibani et al (2019), GonzalezMancebo et al (2019) and Ercan et al (2012) also found that teachers had inadequate knowledge levels about this issue [14, 15, 21, 22].

Teachers who received first aid education and wanted to know about food allergy and anaphylaxis management were found to have higher food allergy and anaphylaxis management self-efficacy. In their interventional studies that provided teachers with trainings on how to use epinephrin auto-injector and how to perform first aid in case of anaphylaxis, Dumeier et al (2018) and Wahl et al (2015) found that the teachers' attitudes and self-efficacy mean scores were higher after the training [23, 24].

Food allergy and anaphylaxis management self-efficacy was found to be higher in teachers who had a student with food allergy during the time the study was

conducted and those who thought that food allergy and anaphylaxis management in school was teachers' duty. Polloni et al (2016) investigated self-efficacy in food allergy and anaphylaxis management and found that teachers who had a student with food allergy were more experienced. Besides, having to manage this condition was found to affect teachers' attitudes and self-efficacy about food allergy management [19].

Cantariño and Novío (2019) investigated primary and secondary school teachers' proficiency in anaphylaxis management and found that food allergy and anaphylaxis management self-efficacy levels were higher in teachers who thought that anaphylaxis management was the teacher's duty. In their study that investigated the confidence and attitudes of teachers about their roles in anaphylaxis management, Alsuhaibani et al (2019) found that teachers who had students with food allergy had higher food allergy and anaphylaxis management self-efficacy levels [14, 25].

This study found that teachers who reportedly panicked/would panic while managing children with food allergy had low food allergy and anaphylaxis management self-efficacy. Similar studies also reported that teachers who reportedly would panic while performing an intervention for a student with food allergy and anaphylaxis had low self-efficacy [15, 18].

Limitations

The limitation of this study is that it was conducted in one city. As the data were collected online, no monitoring was possible whether the teachers benefitted from any sources of knowledge while answering questions, which is an important limitation of the study.

CONCLUSION

Teachers were found to have an inadequate level of food allergy and anaphylaxis management self-efficacy. Teachers who worked with little children, who received first-aid education, who had students with food allergy diagnosis, who wanted to be proficient on this issue and who saw this as duty; namely who had awareness about the issue had higher food allergy and anaphylaxis management self-efficacy. Teachers' knowledge and self-efficacy levels need to be assessed periodically in regions and countries where health professionals are not employed in schools and thus food allergy and anaphylaxis management is left to teachers' responsibility. The results of this study are believed to be a guide for experimental studies to increase teachers' self-efficacy and knowledge levels.

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ETHICS CONSIDERATION

Scientific Research Ethics Committee of the university (ethics committee approval dated 26.05.2021 and numbered E.9659).

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AUTHOR CONTRIBUTION

Authors had equal contribution to designing study, collecting data, revising the initial draft, and approving the final draft.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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