Health Educational Program for Guardians of Primary School Children with Food Allergy

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Abstract

Background: Food Allergy is an issue of public health concern since it triggers life-threatening reactions and has an adverse immune reaction to a food allergen, mainly of protein nature. **Aim of the study:** This study was conducted to evaluate the effect of health educational program among guardians of primary school children with food allergy. **Research design:** A quasi-experimental design was utilized in this study. **Setting**: The present study was conducted at the Allergy, Immunology and Rheumatology Clinic in Children's Hospital, Ain Shams University. **Sample type:** Convenience sample was used in this study, the total sample was 200 guardians. **Tools of data collection**: Two tools were used**, Tool I:** A structured interview questionnaire to assess; **A:** Socio demographic characteristics of guardians and child personal characteristics, **B:** Health problem associated with food allergy, **C:** Family history of food allergy, **D:** Knowledge of guardians about food allergy, **E:** Reported practices of guardians regarding food allergy. **Tool II:** Concerned with guardians' attitude regarding food allergy. **Results:** 75.0% of studied children had itching, 13.5% of studied guardians had good knowledge about food allergies in preprogram, compared to 78.0% post program implementation, 47.5% of studied guardians had satisfactory reported practices in preprogram, compared to 92.5% in post program implementation, 28.5% of studied guardians had positive attitude in preprogram, compared to 92.5% in post program implementation, there was highly statistically significant correlation between guardians' total knowledge, attitude, and reported practices. **Conclusion:** The guardians' knowledge, attitude and reported practices about food allergy were improved after the implementation of the program. **Recommendations:** Continuing intervention that equips primary school children with effective strategies that help them and their guardians to deal with food allergy.

Keywords: Food allergy, Guardians, Health educational program, Primary school children.

Introduction:

The primary school year of childhood involves growth and development particularly in communication and understanding. This stage is called a concrete operational stage, where children are more able to apply past experiences to new situations faced in lives and begin to understand cause and effect, they are inquisitive and need more explanation for everything. A child's early experience has an immense impact on the development of his physical, emotional, and cognitive skills the most dramatic changes probably occur in the domain of self- regulation and executive functions, children become much more capable of inhibiting unwanted behavior, maintaining sustained attention, making and following plans **(Potter et al., 2020).**

Guardians are people who have been given the legal duty to care for a child. The designated individual is also responsible for

the ward's treatment (the child) and the affairs of that person. It is often known as a "conservator" when referring to a child seeking treatment. A judge normally chooses or appoints the guardian at a court of law. In case of the parents' death or failure to care for the children, a parent frequently appoints a guardian to his or her children. Guardians are regulated by state and local rules and are the fiduciary of the district **(Nagin et al., 2023).**

Food Allergy (FA) has rapidly increased in recent years and affects over 26 million Americans. FA affects children more frequently than adults, with FA affecting one in every thirteen children under eighteen years of age. It occurs when a person's immune system has an adverse reaction to stimuli, referred to as allergens. There are over 170 foods that may elicit allergic reactions in people, though eight food allergens in particular account for the majority of food-allergic reactions: shellfish, dairy, peanut, tree nuts, egg, fish, wheat, and soy **(Sicherer et al., 2020).**

Exposure, contact, and/or ingestion of allergens can prompt symptoms of allergic reactions. Symptoms can be mild and include reactions such as sneezing, stomach pain, or rashes to more severe reactions such as difficulty breathing, altered heart rate, loss of consciousness, and anaphylactic shock. FAs are primarily controlled by avoidance of allergens, early recognition of reactions, and immediate treatment of symptoms of reactions. These methods of controlling it require a high degree of lifestyle modification, self-awareness, and advocacy skills. They also place substantial psychological distress on those affected and their guardians **(Bachelani et al., 2023).**

Community health nurses emphasize early disease detection in healthy-appearing primary school age children with subclinical forms of the disease. The subclinical disease consists of pathologic changes, but no overt symptoms that are diagnosable in a doctor's visit. Secondary prevention often occurs in the form of screenings and provides adequate interventional treatment. Secondary prevention targets children who are already sensitized and aims to halt the progression of sensitization. Multiple modes of dietary advancements have been introduced, such as the introduction of baked products, food ladders and oral immunotherapy **(Kisling, 2022).**

Significance of the study

The prevalence of food sensitization ranges from 10% in normal children to 30% in atopic children with increased incidence in Egyptian children. It was recognized that children living in cities have a prevalence rate of FA that is larger than their counterparts who live in rural areas. More specific allergen components related to IgE antibodies were found in74.5% of the study participants. In addition, the percentage of children who were diagnosed with food allergies reached 22.3% whereas the percentage of those who were confirmed with food allergy was 4.3%. Furthermore, Egg yolk was represented as the most frequently food allergen with a percentage of 27.7% whereas egg white and cow milk amounted to 23.4% **(Anania et al., 2021).**

Aim of the study:

The study aimed to evaluate the effect of educational program for guardians of primary school children with food allergy.

Research hypothesis:

The health educational program improved the knowledge, and reporting practices for guardians of primary school children with food allergy.

Research design:

A quasi-experimental design was utilized in this study.

Setting:

The present study was conducted at the Allergy, Immunology and Rheumatology Clinic in Children's Hospital, Ain Shams University which the children following up for their food allergy, because there wasn't specialized clinic for children's food allergies in Banha.

Sample: Convenience sample was used in this study, the total sample was 200 guardians.

Tool of data collection:

Two tools were used in this study:

Tool I: A: structured interviewing questionnaire used in this study. It was comprised of five main parts.

First part:

A: Socio-demographic characteristics of the guardians which consisted of 6 closed ended questions that included: (age, sex, guardian's occupation, residency … etc).

B: It was concerned with child personal characteristics which consisted of 5 closed ended questions that included: (age, sex, child's order of birth … etc).

Second Part: It was concerned with health problems associated with food allergy which consisted of 12 closed ended questions that include: (itching, acute urticarial, Angioedema, vomiting, acute diarrhea ...ect)

Third part: It was concerned with family history of food allergy which consisted of 2 closed ended questions that included: (positive, negative).

Fourth part: It was concerned with guardians' knowledge about food allergy and consisted of 8 closed ended questions that include: Meaning, causes, signs and symptoms, foods causing allergy, prevention, diagnosis, treatment, and source of knowledge.

Scoring system:

The scoring system for guardian's knowledge calculated for each area of knowledge, the score of the items were summed- up and the total divided by the number of the items, giving a mean score for the part. And a mean score for the total knowledge: calculated and classified into (2) for correct & complete answer, (1) for correct incomplete answer, while (0) for I don't know answer, these scores were converted into a percent scores. So total scores of knowledge = 14 points. The total score was considered good when the score of the total knowledge ≥ 75% (≥11 score), while considered average if it is equal 50% ≤ 75% (7≤11 points), and considered poor if it is less than 50% (<7 points).

Fifth part: It was concerned reported practices of guardians' about food allergy which divided into 6 items include:

Digestive system: It was Concerned 6 closed ended questions.

Skin: It was Concerned 8 closed ended questions.

Respiratory system: It was Concerned 8 closed ended questions.

Nervous system: It was Concerned 5 closed ended questions.

Guidelines for guardians: It was Concerned 11 closed ended questions.

Guidelines for healthy life for children: It was concerned 11 closed ended questions.

Scoring system:

Guardians reported practices regarding food allergy score for each answer as follows: (2) for always done, (1) for sometimes done and (0) for never done. These scores of the items were summed –up and the total divided by the number of the items giving a mean score. These scores were converted into percent score.

Total scores of practice = 49 points

- Satisfactory: when the total score more than ≥60% = (≥30 points).
- Unsatisfactory: when the total score less than ≤ 60% = (≤30 points).

Tool II: It was concerned with guardians' attitude regarding food allergy. It was adopted by **Gohal, 2020)** and modified by researchers to accept and reject the reality of food allergy. It consisted of 10 closed-end questions

Scoring system:

The scoring system for guardians attitude was measured on likert scale, attitude of guardians regarding food allergy calculated for each answer was given as follows: (2) for agree, (1) for uncertain and (0) for disagree, the scores of the items were summed – up and the total divided by the number of the items, giving a mean score for the part and the mean score for total attitude :calculated and classified into two attitudes level(positive, neutral or negative), these scores were converted into a percent score 20 points = 100%. The total attitude scores were considered positive if the points ≥ 75% (≥ 15 points), while considered neutral if it is equal 50%≤75% (10≤15 points), and considered negative if it is less than 50% (<10 points).

Tools validity:

Tools of data collection were investigated for content validity by panel of five jury experts from Community Health nursing Department to judge clarity, relevance, comprehensiveness, understanding, applicability, and easiness for implementation of tools. The opinion was elicited regarding layout, format, and sequences of the questions and all of their remarks were taken into consideration and the tools were considered valid from the experts' point of view.

Tools reliability:

Reliability for tools was applied by the researchers for testing the internal consistency of the tools. Internal consistency reliability of all items of the tools was assessed using Cronbachs Alpha coefficient test. Internal consistency of knowledge was 0.776, attitude was 0.701, and guardians reported practices were 0.821.

Ethical consideration:

Approval and an informed consent was obtained from Research Ethical Committee at Faculty of Nursing Benha University to conduct the study, and oral or written consent from all study participants was obtained after explaining the purpose of the study to gain their trust and cooperation. Each guardian had a choice to continue or withdraw from the study. Privacy and confidentiality were assured. Ethics, value, culture, and beliefs were respected. The data was stored in a confidential manner.

Pilot study:

The pilot study took one month from the beginning of November 2023 to the end of November 2023. It was conducted on 10% of the total studied sample represented that 20 guardians. The pilot study was aimed at testing the feasibility, clarity, applicability of the tools and time needed to fill each sheet, completing the sheet consuming about 15 to 30 minutes. No modifications were made, so the pilot study sample was included to the total sample.

The health educational program was conducted through the following phases:

Preparatory and assessment phase:

This phase took one month from the beginning of December 2023 to the end of December 2023. The researchers reviewed the national and international related literatures and different studies about food allergy using textbooks, evidence-based practices, journal books, periodicals, magazines and internet. This helped the researchers to be acquainted with various aspects of the research problem and guided the researchers to prepare the required tools of data collection. At the

beginning of the interview the researchers introduced themselves to each guardians, greeted the guardians included in the study, explained the purpose, duration, activities, and take oral consent. Then the researchers distributed the tools for collecting data to assess guardians' demographic characteristics, knowledge, attitude, and practices regarding food allergy. Each questionnaire took about 15-30 minutes.

Planning phase:

This phase took one month from the beginning of January 2024 to the end of January 2024. Based on baselines data obtained from assessment phase and review of literature, the health educational program regarding food allergy was designed by the researchers to enhance the guardian's knowledge, attitude, and reported practices regarding primary school children with food allergy. The researchers designed 10 sessions, 4 theoretical sessions and 6 practical sessions regarding food allergy. The number of sessions and its contents, different methods of teaching and instructional media were determined and explained to the participants. The contents of program were prepared according to the guardian's level of understanding in simple, organized and scientific Arabic language.

The program objectives included:

General objectives:

By the end of health educational program sessions the guardians can acquire knowledge and practice related to food allergy.

Specific objectives:

By the end of health educational program the guardians of primary school children with food allergy can be able to:

*Recognize basic rules of health educational program.

* Meaning food allergy.

* Enumerate causes of food allergy.

* Determine food that cause food allergy.

* Enumerate sign and symptoms of food allergy.

* List methods of diagnosis of food allergy.

* List methods of treatment of food allergy.

* List healthy habits regarding food allergy.

*Discuss methods of prevention for food allergy.

*Apply practices of guardians regarding food allergy symptoms.

*Evaluate the impact of the program on the guardians of primary school children with food allergy.

Implementation phase:

This phase took three months (from the beginning of February 2024 to the end of April 2024), the data was collected from guardians through interview of them after taking their acceptance to participate in the study and explaining the aim of the study, the researchers was attended one day/week (Wednesday) for the Allergy, Immunology and Rheumatology Clinic in Children's Hospital, in Ain Shams University from 9.00 am to 1.00 pm. Each guardian was individually interviewed using Arabic structured interviewing questionnaire. The average number of interviewed guardians was between 7-8 guardians/day depending on their responses to the interviewers, each interviewed mother takes about 15-30 minutes to fill the sheet tool. Implementation of the program done through sessions, the numbers of sessions were 10 sessions (4 theoretical and 6 practical), the expected duration of each session was from 30 to 40 minutes, used group discussion also booklet utilized, with clearance of general and specific objectives as follow:

The researchers implemented theoretical and practical sessions as following:

Theoretical part: It covered four sessions about two hours and forty minutes as follows:

First session: At the beginning of the first session, the researchers introduced themselves

to guardians, take oral informed consent of guardians. The researchers provided a trust, warm and secure atmosphere between guardians and relieved anxiety, tension. The researchers gave the guardians a handout (booklet) and provided an orientation about the program objectives, activities and content and provided studied guardians with knowledge about food allergy which included meaning of food allergy, causes of food allergy, and food that cause food allergy.

Second session: The researchers covered the signs and symptoms of food allergy, methods of diagnosis of food allergy, and methods of treatment of food allergy.

Third session: The researchers explained healthy habits regarding food allergy and methods of prevention of food allergy.

Fourth session: The researchers revised in all sessions, evaluated the impact of the program on the guardian's knowledge about food allergy.

Practical part: It covered six sessions about three hours as follows: -

First session: The researchers demonstrated practices of guardians regarding skin allergy signs. (Itching, urticarial, lips, tongue, face, and eyes swelling).

Second session: The researchers trained guardians about practices regarding gastro intestinal symptoms related by food allergy (Vomiting, diarrhea, constipation and abdominal pain).

Third session: The researchers trained guardians about practices regarding respiratory symptoms related by food allergy (bronchial asthma, allergic rhinitis and difficult breathing).

Fourth session: The researchers trained guardians about practices regarding neurovascular system symptoms related by food allergy (headache, convulsion).

Fifth session: The researchers demonstrated guardians about practices regarding guidelines.

Six session: The researchers demonstrated guardians about practices regarding guidelines for healthy life for children.

Evaluation phase:

This phase took three months (from the beginning of May 2024 to the end of July 2024), after implementation the health educational program the researchers applied the post-test immediately to evaluate the knowledge acquired. Evaluation of the program was done by using the post-test questionnaire which was the same formats of pre-test in order to compare the change in the guardians' knowledge and practices related to food allergy immediately after implementation of the program.

Results:

Table (1) clarifies that; the mean age of the participated guardians was 33.6±5.4 years, 60% of them aged between 30 and 40 years. The guardians were mainly the mothers (96%). and 15% of them were hardly living, 58% of the guardians were not working.

Table (2) reveals that; the mean age of the studied children was 8.2 ± 2.1 years, 52.0 % of them were males. Most of the children (71%) were either the first or the second child for their parents. As regards the allergic food, 24.5% of the children were allergic to multiple food elements >3.

Table (3) shows that; the most common presenting manifestation of food allergy was 75% of studied children have itching, 73% of studied children have urticarial, 49.0% have abdominal pain, 39.5% have bronchial asthma, and 33.5% have headache.

Figure (1) shows that; 81.0% of studied children have family history of food allergy, while 19.0% don't have history of food allergy.

Figure (2) shows that 13.5% of studied guardians had good knowledge at pre-program implementation, compared to 78.0% after implementation of the program.

Figure (3) reveals that; 52.5 % of studied guardians' practices were Unsatisfactory at pre- program implementation, compared to 7.5 % of guardians post program implementation. And 47.5 % of guardians with satisfactory practices at pre- program implementation and increased to 92.5% post program implementation.

Figure (4) reveals that; 71.5 % of studied guardians' attitudes were negative at pre-program intervention compared to 13.0 % of guardian's post- program implementation. And 28.5 % of guardians with positive attitudes at pre- program implementation and increased to 87.0 % post- program implementation.

Table (4) shows that; there were highly statistically significant correlation between total knowledge total practices and their attitude among studied guardians regarding pre and post program. ($p < 0.001$).

Table (5) shows that; there were highly statistically significant correlation between total practices and attitude among studied guardians regarding pre and post program. ($p < 0.001$).

Table (1): Frequency distribution of studied guardians regarding their socio demographic characteristics (n=200).

Socio demographic characteristics	No.	%.
Age		
20<30 years	58	29.0
30<40 years	120	60.0
>40 years	22	11.0
Min-Max	23-46	
Mean ±SD	33.56±5.41	
Sex		
Male	8	4.0
Female	192	96.0
Guardians occupation		
work	84	42.0
Don't work	116	58.0
Residence		
Urban	69	34.5
Rural	131	65.5
Family income		
Enough	170	85.0
Don't enough	30	15.0

Table (2): Frequency distribution of studied child regarding their personal characteristics (n=200).

Child personal characteristics	No.	%.
Age		
6>9	163	81.5
9>12	37	18.5
Mean ±SD	8.21±2.11	
Sex		
Male	104	52.0
Female	96	48.0
Child arrangement		
Alone	18	9.0
First child	72	36.0
Second child	70	35.0
Third child	36	18.0
Fourth child	4	2.0
Number of food allergies		
One type	35	17.5
Two type	65	32.5
Three type	51	25.5
More than three type	49	24.5

Table (3): Frequency distribution of studied children regarding their problem associated with food allergy (n=200).

Problem associated with food allergy	No	%
Digestive system		
Vomiting	93	46.5
Diarrhea	51	25.5
Constipation	50	25.0
Abdominal pain	98	49.0
Skin		
Itching	150	75.0
Urticarial	146	73.0
lips, tongue, face, and eyes swelling	50	25.0
Respiratory system		
Bronchial asthma	79	39.5
Allergic rhinitis	66	33.0
Difficult breathing	74	37.0
Nervous system		
Headache	67	33.5
Convulsion	15	7.5

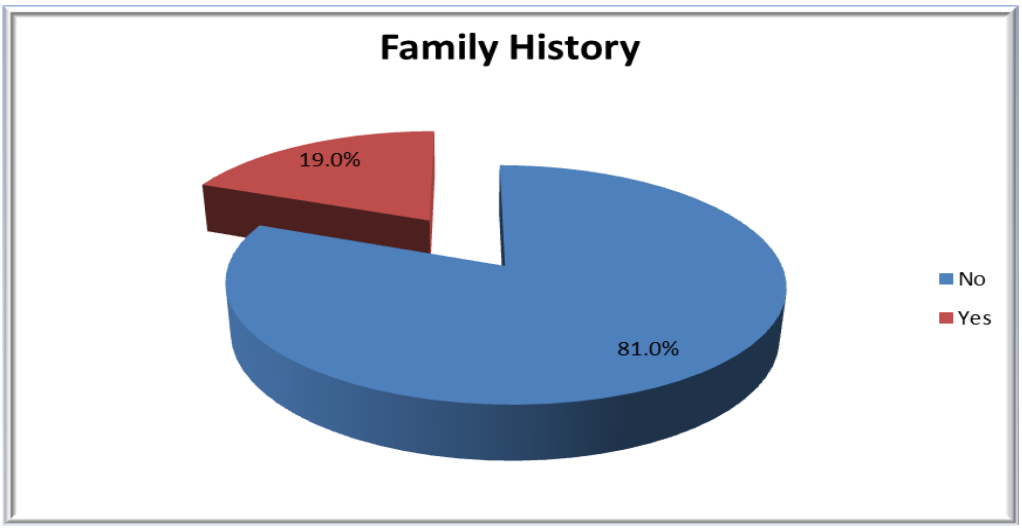

Figure (1): Percentage distribution of studied sample regarding family history of food allergy (n=200)

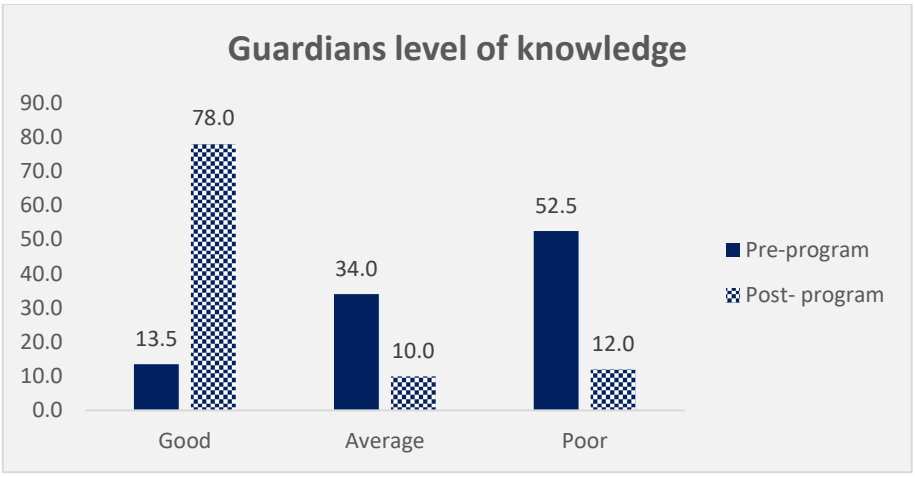

Figure (2): Percentage distribution of studied guardians regarding their total knowledge level pre and post program (n=200)

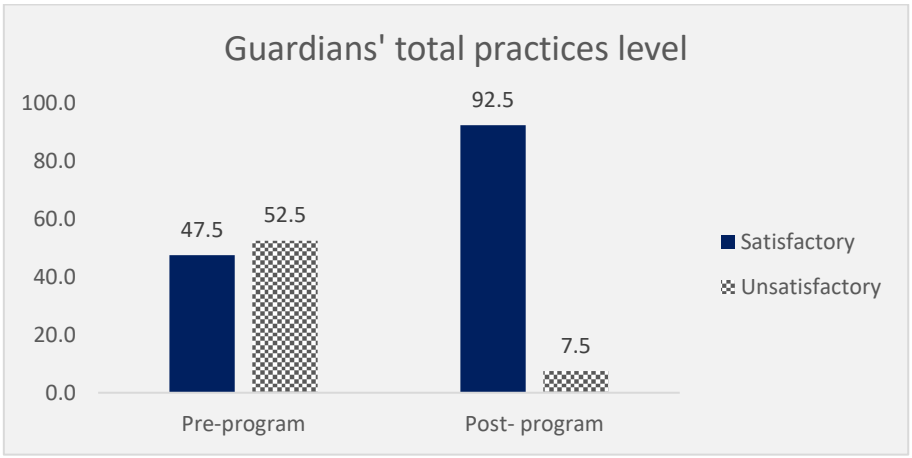

Figure (3): Percentage distribution of studied guardians regarding their total practices level pre and post program (n=200)

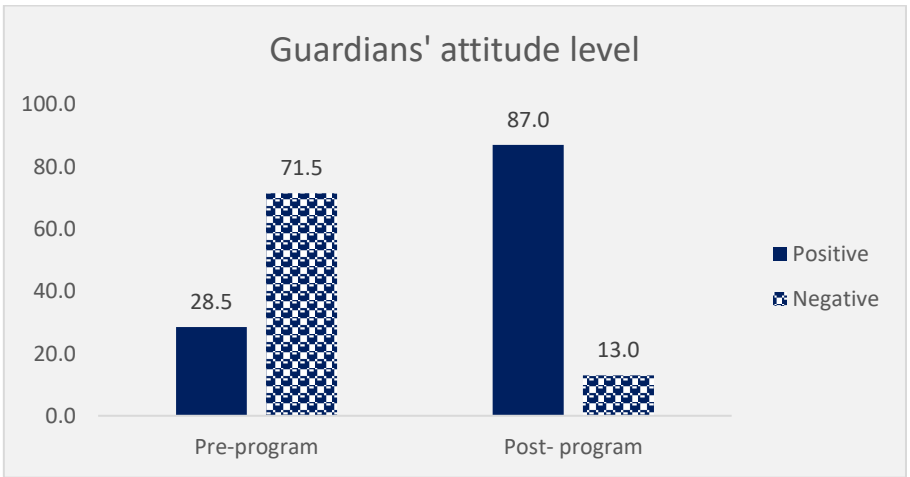

Figure (4): Percentage distribution of studied guardians regarding their total attitude level pre and post program (n=200)

Table (4): Correlation between total knowledge level, total practices and their attitude among studied guardians regarding pre and post program

Total knowledge				
Items	**Pre-program implementation**		**Post- program implementation**	
	r	p-value	r	p-value
Practices	.709	.000**	.981	.000**
Attitude	.476	.000**	.853	.000**

** High statistically significant difference (p <0.001).

Table (5): Correlation between total practices and attitude among studied guardians regarding pre and post program

Total practices				
Pre-program implementation			**Post- program implementation**	
Attitude	r	p-value	r	p-value
	.326	.002*	.648	.000**

* Statistically significant difference (p <0.005). ** High statistically significant difference (p <0.001).

Discussion:

Food allergy is a condition in which the immune system reacts unusually to a certain food. Upon re-exposure to these relevant food antigens, children with FA develop multi-systemic immune responses. Immunoglobulin-E (IgE) and non-IgE antibody-mediated reactions are the two main types of food allergies. After exposure to antigen, the release of mediators that act on the endothelium, smooth muscle, and epithelium causes immediate harmful adverse symptoms. It affects about 4–15% of children, and also the prevalence is rising among school-aged children **(Alomran, et al., 2022).**

Food allergy rates vary by age, local diet, and many other factors, however eight types of food account for over 90% of allergic reactions in affected children: milk, eggs, peanuts, tree nuts, fish, shellfish, soy, and wheat. The evaluation of a child with suspected food allergy requires a detailed history and physical examination, and confirmatory tests, such as Skin Prick Tests (SPT) and/or serum-specific IgE testing to foods (Immuno CAP). In some cases, Oral Food Challenges (OFC) may also be required **(El feky et al., 2024).**

According to socio-demographic characteristics of the studied guardians. The current study showed that three fifth of the studied guardian's aged from 30<40 years old with mean age33.56±5.41 years. This finding in the same line of **Ramos et al., (2021)** who studied "The Food Allergy Parent Mentoring Program". in Washington (n=18) mothers, and found that parent's age 30-44years with mean age 36.60±4.33, however this finding disagreed with **Gomaa et al., (2020),** who studied "Knowledge and awareness about food allergy among mothers with allergic children". In Taif city, Saudi Arabia, (n= 400) mothers, and reported that 40% of mother's had an age more than 40 years old.

Regarding sex of guardians. This study showed that the most of studied guardians were female. This finding was in the same line with **Gomaa et al., (2020),** and reported that the most of studied participants were mothers. However, this finding was not in the same line with **Lokman and Akoğlu, (2022),** who studied "Food allergy knowledge, attitudes, and practices of food handlers working in the five-star hotel kitchens". In Turkey (n= 450) participants, and reported that 71.8% of the participants were male.

Regarding occupation of guardians. This study revealed that slightly less than three fifth of studied guardians are housewife. This finding was in the same line with **Kilic etal., (2023),** who studied "Quality of life in children with food allergies, psychiatric symptoms, and caregiving burden of their mothers". In Turkey (n= 168) participants and reported that two third of studied mothers are housewife. While this finding was not in the same line with **Tatlı and Akoğlu, (2020),** who studied" Food Allergy Knowledge, Attitude and Practices of Restaurant Employees. In Turkey (n= 490) participants, and reported that (100%) of participants were employment.

Concerning residence. This study showed that two thirds of studied guardians living in rural areas. This observation agreed with **Abd El Baset et al., (2018),** who studied "Mothers Awareness Regarding Food Allergy among Their Children". in Ain shams (n= 730) mothers, who found that (77.9) of studied mothers living in rural area, and this finding was not in the same line with **Mohamed et al, (2022),** who studied "Pollen Sensitization among Egyptian Patients with Respiratory Allergic Diseases", in Egypt (n= 200) children, and found that 65% of studied guardians living in urban area.

Regarding income, this study showed that less than fifth of studied guardians had hardly

living. This finding was in the same line with **Alhuzimi and Alharbi, (2022),** who studied "Perceptions of Parents on Management of Food Allergy in Children with Autism Spectrum Disorder (ASD)". In Saudi Arabia (n=125) parents and reported that less than fifth of studied parents had low income, while this finding was not in the same line with **Mahmoud and El-Safty, (2019),** who studied "The Impact of Food Allergy on the Quality of Life in Adolescents". In Egypt (n=144) participants and reported that 63% had low family income.

Regarding to sex of the studied children, the current study showed that more than half of the studied children were males. This finding was in the same line with **Abed et al., (2023),** who studied" Food Allergy and Asthma Exacerbation in Asthmatic Children". In Benha, (n=100) children, and reported that more than half of studied children were males, however this finding not agreement with **Khaleva et al., (2021),** who studied" Perceptions of adolescents and young adults with allergy and/or asthma and their parents on EAACI guideline recommendations about transitional care". In Europe, (n=1210) participants, and reported that 68% of studied children were females.

Regarding children's age, the current study showed that the majority of studied children aged 6-9 years. This observation is agreement with **Alqahtani et al., (2021),** who studied "Perception of food allergy among mothers of allergic children, in Saudi Arabia" (n= 980) mothers, and reported that the majority of studied children aged 6-9 years, while this finding not in the same line of **Abdallah et al., (2020),** who studied" Food sensitization in preschool Egyptian children with recurrent wheezing". In Assuit, (n= 100) children, and reported that 100% aged from 2 to 5 years.

Regarding child arrangement, this study showed that more than one third of studied children were the first arrangement. This observation not agreement with **Ullmann et al., (2022),** who studied "Attitudes and Practice of Caregivers for Cow's Milk Allergy according to Stages of Behavior Change. In Brazil (n= 30) caregivers, and reported that 66% of studied children were the first arrangement.

Concerning number of allergy related to children, this study showed that third of the studied children had two types of allergy; **(table 2).** This observation is agreement with **Chooniedass et al (2020),** who studied Parents of children with food allergy. In Canada (n=40) parents and reported that third of the studied children had two types of allergy, however this observation not agreement with **Khaleva et al., (2021),** who reported that 30% of children had one type of allergy.

According to manifestation of food allergy, the current study showed that three quarters of studied children had itching. This finding agreement with **Maqbul et al., (2022),** who studied" A Cross-Section Survey Assessment Study on the Prevalence of Knowledge and Awareness toward the Attitude on the Severity of Food Allergy among the Saudi Population. In Jeddah Region Saudi Arabia (n= 2060) participants, and reported that 57.7% of studied children had itching, while this finding not agreement with **Bucak and Yiğit, (2021),** who studied "The Evaluation of Food Allergy Knowledge and Attitudes of Hotel Service and Kitchen Staff. In İzmir (n= 808) participants and reported that 85% of participants had difficulty breathing.

Regarding the family history of food allergy, the current study showed that the majority of the studied guardians had positive food allergy. This finding agreement with **Abdallah et al., (2020),** who reported that the

majority of participants had positive food allergy, and this finding wasn't in agreement with **Anania et al., (2021),** who studied" Screening of Immunoglobulin E mediated Food Allergies among Children". In Suez Canal (n= 188) and reported that 63% of children had negative food allergy.

According to total knowledge of guardians, the findings of the present study illustrated that more than three quarters of the studied guardians' knowledge significantly improved ($p < 0.001$) on post program implementation. This finding in the same line of **Kwen and Ja oh, (2022),** who studied "Development and Evaluation of a Mobile Web-based Food Allergy and Anaphylaxis Management Educational program for Parents of School-aged Children with Food Allergy: A Randomized Controlled Trial". In United Status of American (USA) (n=73), and reported that the majority of the studied guardians' knowledge significantly improved ($p < 0.001$) on post program implementation. While this finding wasn't in the same line of **Maqbul, et al., (2022),** who reported that slightly less than three fifth of participants had poor knowledge. From the researchers` opinion this might be due to those guardians were interesting with program content.

According to the total practices of the guardians showed that the studied guardians had satisfactory practices after implementation of the health educational program. This finding was incongruent with **Lokman and Akoglu, (2022)**, and reported that 86% of the participants had satisfactory practices, and also this finding was incongruent with **Kwen and Ja oh, (2022),** who studied "Development and Evaluation of a Mobile Web-based Food Allergy and Anaphylaxis Management Educational program for Parents of School-aged Children with Food Allergy: A Randomized Controlled Trial". In United Status of American (USA) (n= 73) and reported that there was highly significant improvement of parent's practices. From the researchers' point of view, this might be because of health educational program on improving practices of the guardians.

According to attitude of guardians, the current study showed that the majority of the studied guardians' attitude was significantly improved ($p < 0.001$) after the educational program. These findings are incongruent with **Kwen and Ja oh, (2022),** who reported that there was highly significant improvement of parent's attitude, and also This finding is incongruent with **Elsahoryi et al., (2021),** who studied" Food allergy knowledge, attitudes and practices (KAP) among restaurants staff. In Jordan (n=306), and reported that the most participants had positive attitude. From researchers' point of view, this might be due to the positive effect of health educational program on changing the attitude of guardians.

Regarding the correlation between total knowledge, practices and attitude scores, the current study showed that there were significantly positively correlated between total knowledge scores, practices and attitude scores of guardians, particularly after the accomplishment of the educational program, **(table.4).** This finding was in agreement with **Lokman and Akoğlu, (2022),** and reported that there were significantly positively correlation between total knowledge, practice and attitude scores. From the researchers' point of view, this might be due to when level of guardian's knowledge increased the guardians' practices and attitude respectively improved.

Regarding the correlation between total practice scores and attitude scores of guardians, the current study showed that there were highly statistically correlated, particularly after the accomplishment of the

educational program, while there was statistically correlation at preprogram**.** This finding agreed with **Soon and Jan Mei, (2019),** who studied Food allergen knowledge, attitude and practices among UK consumers: A structural modeling approach. In UK (n=254) and reported that there was significantly positive correlation between total practice scores and attitude scores. From the researchers' point of view, this result might be due to the application of an effective educational program.

Conclusion:

More than three quarters of studied guardians had good knowledge about food allergy, post program implementation compared to less than fifth at preprogram, while tenth of studied guardians had average knowledge about food allergy, post program implementation compared to third at preprogram, while less than fifth of studied guardians had poor knowledge about food allergy, post program implementation compared to more than half at preprogram. The majority of the studied guardians' attitude significantly improved at post program implementation compared to less than third at preprogram, while less than fifth of studied guardians had negative attitude, post program implementation compared to more than two third at preprogram, the most of studied guardians had satisfactory practices at post program implementation compared to more than half at preprogram, while minority of studied guardians had unsatisfactory practices at post program implementation compared to more than half at preprogram. There were highly statistically significant relation between total knowledge and guardians educational level during pre-post program implementation, there was statistically relation between total reported attitudes score of studied guardians and gender and the urban areas residency during pre-post program, there was statistically significant relation between guardians total reported practices score and their age, gender, level of education and status of working, there was high statistically significant correlation between studied guardians' knowledge, attitude and practices during pre-post program implementation.

Recommendations:

- Developing intervention programs that equip Primary School children with effective strategies those help them and their guardians to deal with food allergy.
- Sustainable update guardians' knowledge and practice regarding food allergy among children to improve quality of life.
- Further research is proposed to explore and generate the effect of health educational program to understanding of the nature of food allergy among primary school children.

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برنامج تعليمي لأولياء الأمورالذين لديهم أطفال في المرحلة الإبتدائيه يعانون من حساسية الطعام

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تعتبر الحساسية الغذائية حدث مهم يثير قلق الصحة العامة لأنها تؤدي إلى ردود فعل تهدد الحياة. لذلك هدفت الدراسة إلى تقييم تأثير البرنامج التعليمي الصحي لأولياء أمور أطفال المدارس الابتدائية الذين يعانون من حساسية الطعام. ، وقد تم استخدام التصميم شبه التجريبي في إجراء هذه الدراسة ، و أجريت الدراسة في عيادة الحساسية والمناعة والروماتيزم بمستشفى الأطفال بجامعة عين شمس والتي يتابع الأطفال فيها حساسية الطعام لديهم ، وقد شملت الدراسة على عينة متاحه من ، و قد أسفرت النتائج على أن لدى أكثر من ثلاثة أرباع اولياء الامور المدروسين معلومات جيدة حول حساسية الطعام بعد تنفيذ البرنامج مقارنة بأقل من خمس في مرحلة ما قبل البرنامج، بينما كان لدى أقل من خمس اولياء الامور المدروسين معلومات ضعيفة حول حساسية الطعام بعد تنفيذ البرنامج مقارنة بأكثر من النصف في مرحلة ما قبل البرنامج. كما تحسن سلوك غالبية اولياء الامور المدروسين بشكل ملحوظ بعد تنفيذ البرنامج مقارنة بأقل من ثلث في مرحلة ما قبل البرنامج، بينما كان لدى أقل من خمس اولياء الامور المدروسين سلوك سلبي بعد تنفيذ البرنامج مقارنة بأكثر من ثلثي في مرحله ما قبل البرنامج ,معظم اولياء الامور المدروسين لديهم ممارسات مرضية بعد تنفيذ البرنامج مقارنة بأكثر من النصف في مرحلة ما قبل البرنامج، بينما كان لدى أقلية من اولياء الامور المدروسين ممارسات غير مرضية بعد تنفيذ البرنامج مقارنة بأكثر من النصف في مرحلة ما قبل البرنامج. كما اوضحت الدراسه ان اكثر الاعراض شيوعا بين الاطفال هي الحكه. كان هناك ارتباط ذو دلالة إحصائية عالية بين معلومات اولياء الامور المدروسة وسلوكياتهم وممارساتهم أثناء فترة ما قبل وبعد تنفيذ البرنامج، ولخصت الدراسه تحسن في معلومات وسلوكيات وممارسات اولياء الامور بعد تنفيذ البرنامج. وقد أوصت الدراسة علي تطوير برامج التدخل التي تزود أطفال المدارس الابتدائية باستراتيجيات فعالة تساعدهم وأولياء أمورهم على التعامل مع حساسية الطعام.