Using E-learning Modules To Educate Pediatric Residents On Critical Topics In Allergy And Immunology.

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Abstract #735

INTRODUCTION

- There has been an increase in the prevalence of allergic and immunologic (AI) disease.
- There is a lack of knowledge among primary care physicians regarding diagnosing and caring for patients with allergic and immunologic disease.
- ACGME (Accreditation Council for Graduate Medical Education) has no specific requirements or components of core curriculum that addresses AI for primary care.
- Studies suggest that an interactive online curriculum that have a focus on improving patient care is an effective way to improve the knowledge gap and increase confidence.
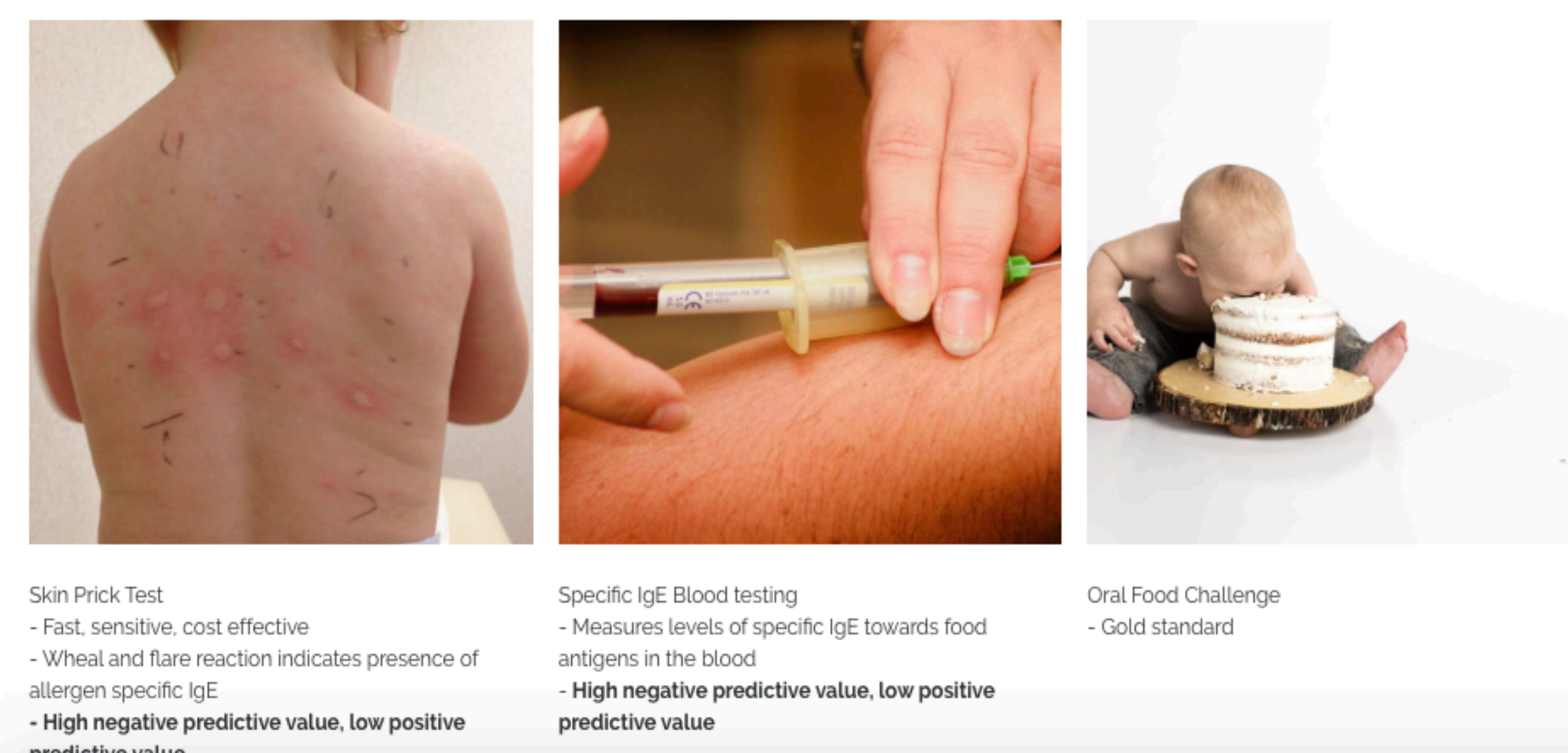
OBJECTIVE

To develop, implement, and evaluate the efficacy of a pilot e-learning curriculum addressing fundamental primary care topics related to allergy and immunology (AI) for pediatric and internal medicine/pediatrics residents.
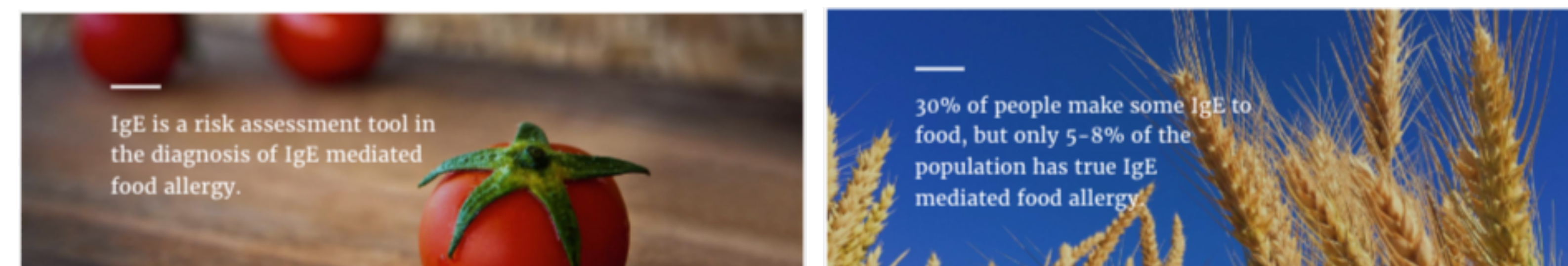
METHODS

- We utilized David Kern's six step approach for curriculum development for medical education to develop online modules through Articulate (an e-learning software).[1]
- Two modules were developed: **food allergy in the primary care office** and **primary immunodeficiency disorders in the primary care office.**
- Modules were offered to 76 residents over the course of 4 months (July, August, December, January).
- The modules were housed on an e-learning platform for Nationwide Children's Hospital (NCH) employees.
- Although the study was aimed at resident education, non-resident NCH employees completed the modules.

FIG 1. The module displays images and descriptions to discuss food allergy testing
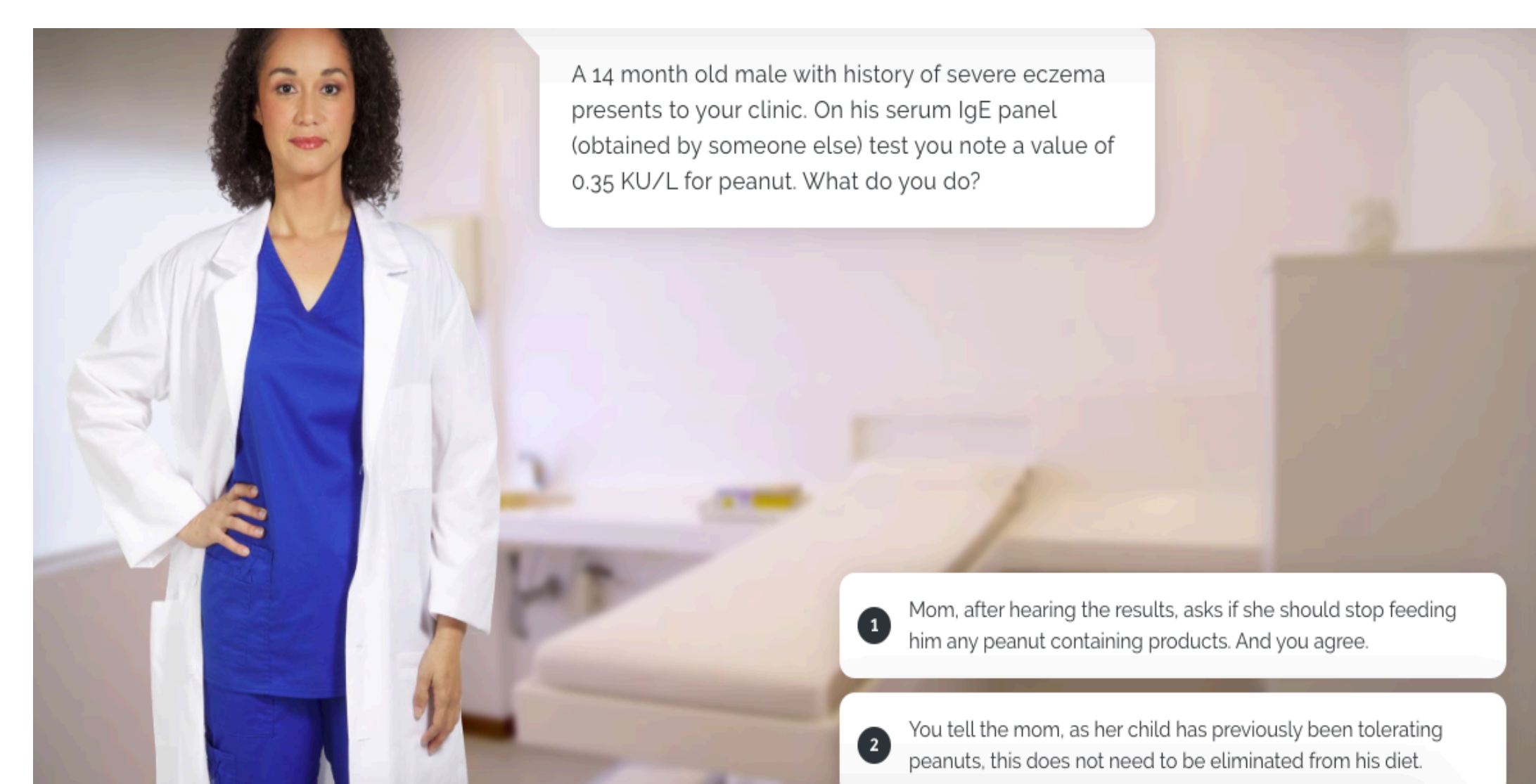

Below are the 3 main methods of food allergy testing:

Skin Prick Test
- Fast, sensitive, cost effective
- Wheal and flare reaction indicates presence of allergen specific IgE
- High negative predictive value, low positive predictive value

Specific IgE Blood testing
- Measures levels of specific IgE towards food antigens in the blood
- High negative predictive value, low positive predictive value

Oral Food Challenge
- Gold standard

FIG 2. The module provides brief, high yield points about IgE mediated food allergies

IgE is a risk assessment tool in the diagnosis of IgE mediated food allergy.

30% of people make some IgE to food, but only 5-8% of the population has true IgE mediated food allergy.

FIG 3. The module provides interactive ways to learn including sorting activities.

Flushing, erythema, non-urticarial skin eruptions

IgE Mediated Food Allergy

Food Intolerance
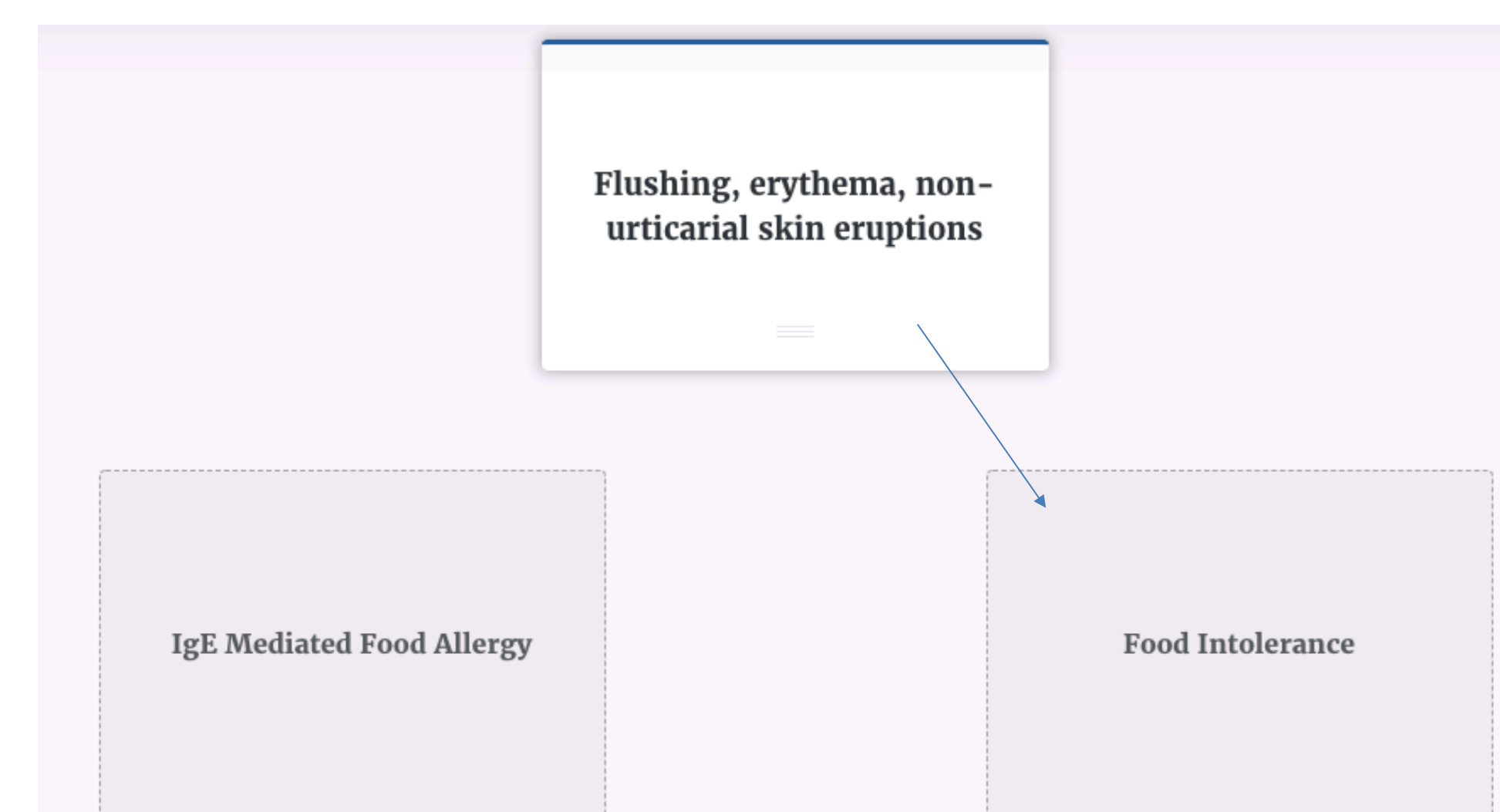
FIG 4. The modules include cases with scenarios that primary care physicians may face regarding food allergy concerns.

A 14 month old male with history of severe eczema presents to your clinic. On his serum IgE panel (obtained by someone else) test you note a value of 0.35 KU/L for peanut. What do you do?

Mom, after hearing the results, asks if she should stop feeding him any peanut containing products. And you agree.

You tell the mom, as her child has previously been tolerating peanuts, this does not need to be eliminated from his diet.
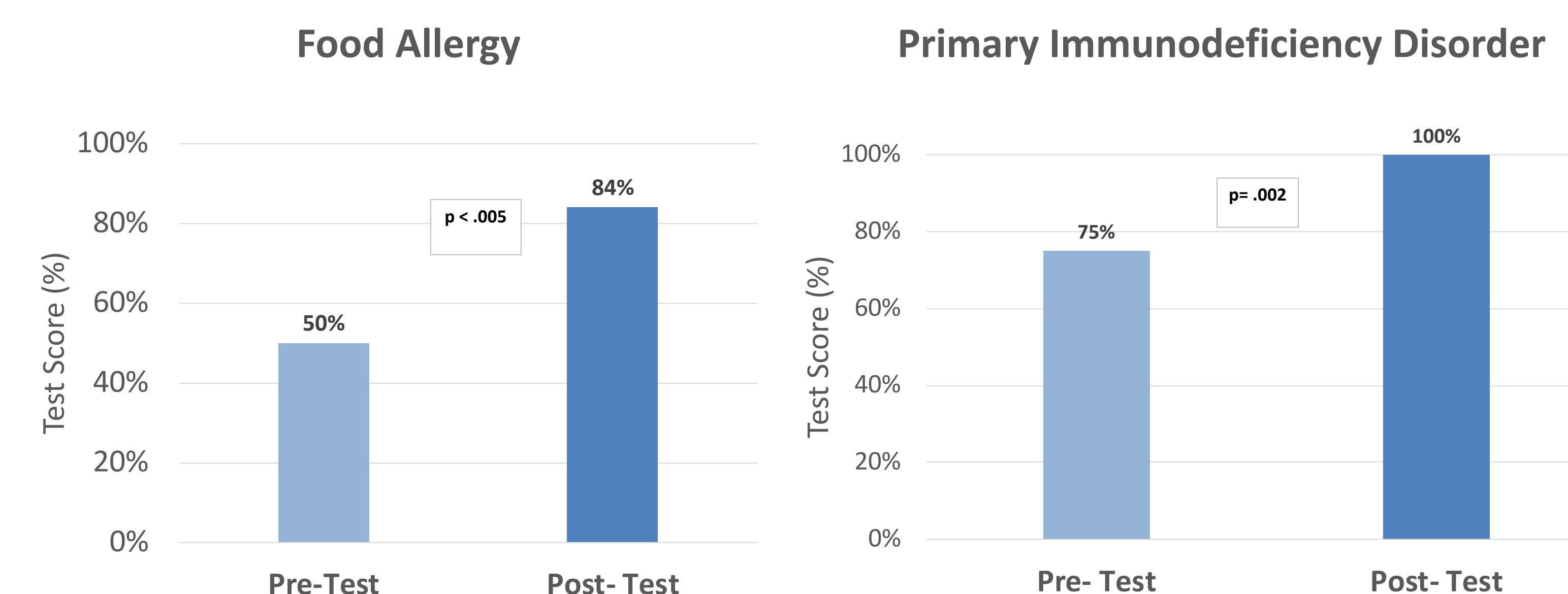
RESULTS

76 residents, were invited to complete the modules:
- 19 residents completed the food allergy module (25%)
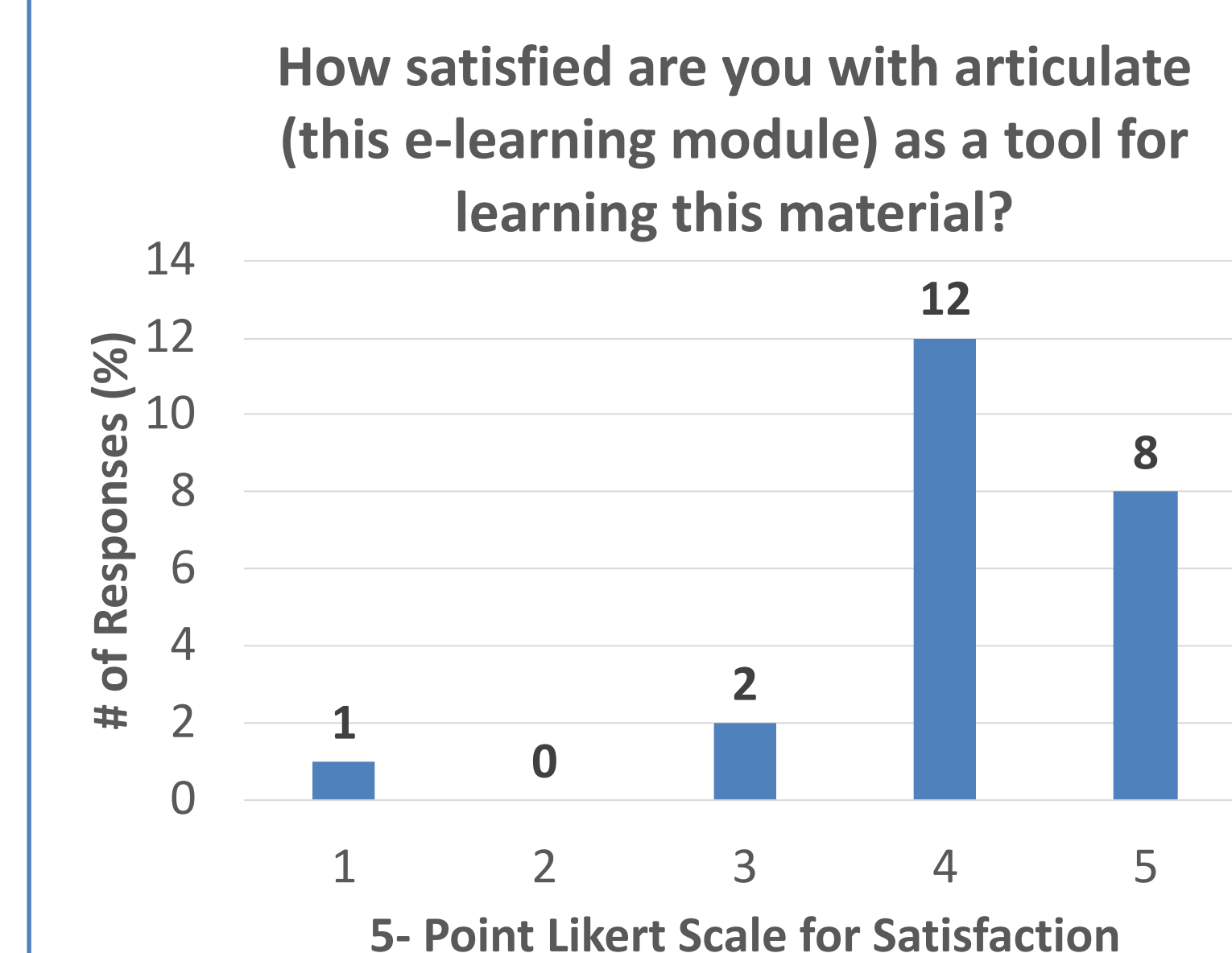- 13 residents completed the primary immunodeficiency disorders module (17%)

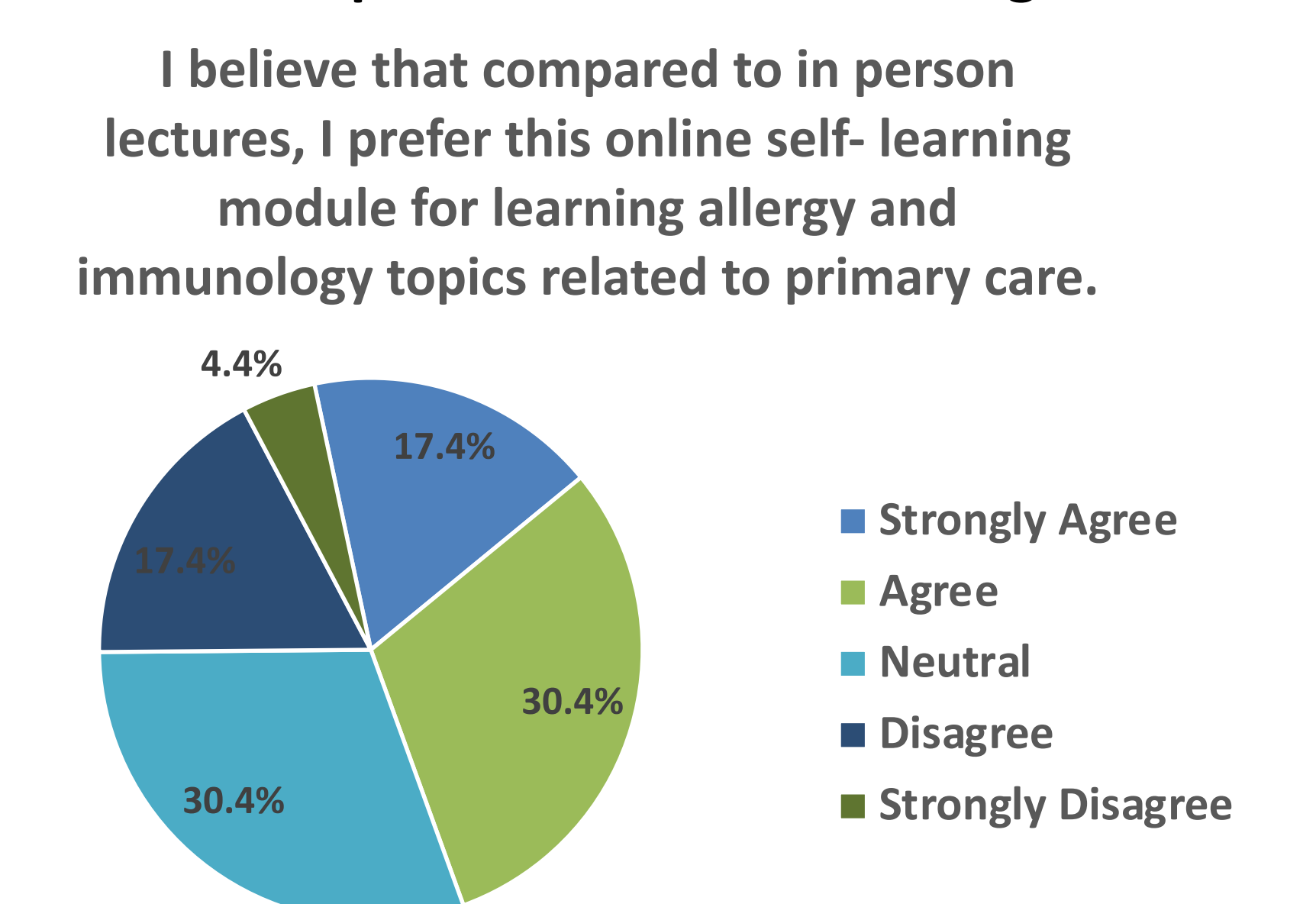**FIG 5. Module Pre- and Post- test scores.**

Food Allergy

Pre-Test 50%, Post-Test 84%, p < .005

Primary Immunodeficiency Disorder

Pre-Test 75%, Post-Test 100%, p= .002

Feedback Survey: Resident Perspective
- **8 residents** completed the feedback survey for the **food allergy module**
- **15 residents** completed the feedback survey for the **primary immunodeficiency disorders module**
- All residents agree that knowledge regarding AI is important for primary care physicians
- 39% of residents believe that they are well trained to identify AI diagnoses seen in the primary care setting
- 35% believe they are well trained to manage AI diagnoses seen in the primary care setting
- 56% believe they are well trained to refer AI diagnoses seen in the primary care setting

FIG 6. Resident satisfaction with articulate

How satisfied are you with articulate (this e-learning module) as a tool for learning this material?

5- Point Likert Scale for Satisfaction

1: 1, 2: 0, 3: 2, 4: 12, 5: 8

FIG 7. Resident preference for e- learning modules

I believe that compared to in person lectures, I prefer this online self- learning module for learning allergy and immunology topics related to primary care.

4.4%, 17.4%, 30.4%, 30.4%

Strongly Agree
Agree
Neutral
Disagree
Strongly Disagree

Feedback Survey: Non-Resident Perspective
- **12 non- residents** completed the feedback survey for the **food allergy module**
- **4 non- residents** completed the feedback survey for the **primary immunodeficiency disorders module**
- Based on a 5 point Likert-scale for satisfaction, majority of non- residents (59%) were satisfied with articulate as a tool for learning AI material
- 53% of non- residents preferred online self- learning modules for learning AI topics.

CONCLUSIONS

- A brief, focused e-learning curriculum is feasible and improved participant knowledge on fundamental AI concepts.
- These modules were also utilized by non-resident adult learners who were satisfied with e-learning modules as a tool for learning allergy and immunology topics related to primary care.

REFERENCES

Kern DE. Curriculum Development for Medical Education, A Six-step Approach. JHU Press; 1998.