Effectiveness of a Virtual Patient Simulation at Classifying Asthma Phenotype and Specialist Referrals Among Pediatricians

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BACKGROUND

Asthma is a lifelong disease that can significantly impact quality of life, with poorly controlled childhood asthma often leading to irreversible declines in lung function. Many adults with asthma have childhood-onset disease, with risk factors for persistence including disease severity, bronchial hyperresponsiveness, and atopy. With the evolving field of asthma management and the emergence of biologics to reduce exacerbations and minimize oral corticosteroid use, pediatricians need ongoing education to stay current with new treatment options and best practices.

METHODS

The intervention comprised two patients presenting in a virtual patient simulation (VPS) platform that allows learners to order lab tests, make diagnoses, and prescribe treatments in a manner matching the scope and depth of actual practice. Tailored clinical guidance (CG), based on current evidence and expert recommendation was provided following each decision, followed by the opportunity for the learner to modify their decisions. Decisions were collected post-CG and compared with each user's baseline (pre-CG) decisions using a McNemar's test to determine *P* values (10% significance level, $P < .001$). Data were collected from August 2024 to October 2024.

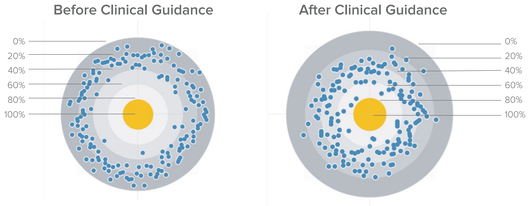
Pediatricians
(n = 348)

How to Read the Linked Learner Assessment

OUTCOMES COMPLETERS

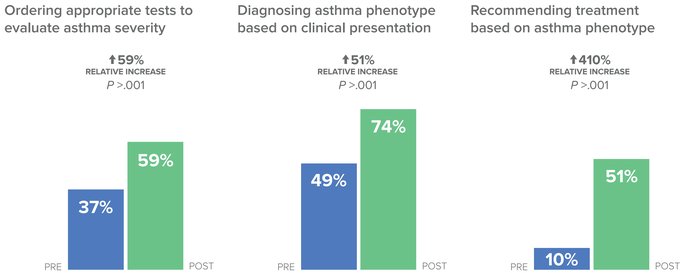
Each individual completed BOTH the pre- and post-education questions – *SAME individuals pre- and post-education*

RESULTS



Each dot on the bullseye represents a learner's average % of correct decisions made across the learning objectives for both patient cases.

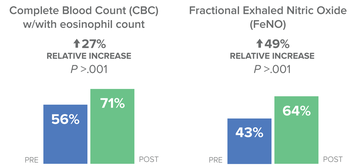
Pediatricians (n = 297-348)



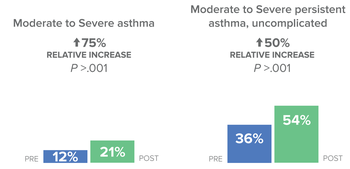
KEY DECISION POINTS THROUGHOUT THE PATIENT CASE SIMULATIONS

Pediatricians, through immersive case-based simulations, demonstrated meaningful improvements in recognizing asthma severity and differentiating phenotypes. This educational approach advanced their clinical decision-making and encouraged earlier intervention, bridging primary care and specialty asthma management. Such skill building is essential to streamline diagnosis and escalate therapy timely—especially for children at risk for severe asthma or uncontrolled symptoms.

Ordering appropriate tests to evaluate asthma severity and phenotype

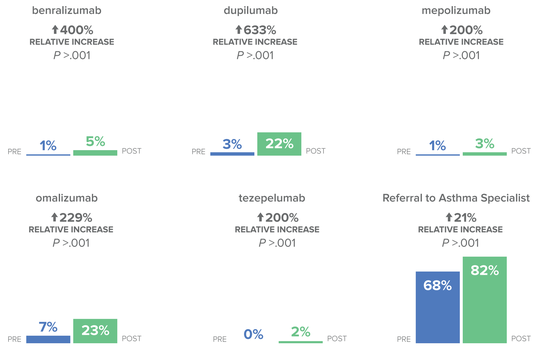


Appropriate asthma diagnosis based on clinical presentation



Significant increase in application of guidelines for the use of patient-reported outcomes in treatment decisions

Recommending treatment based on asthma phenotype



CONCLUSIONS

The results indicate that the CME VPS program substantially improved pediatricians' clinical decision-making in pediatric asthma management. This is crucial since asthma is a heterogeneous condition; using phenotype-specific strategies and adhering to guideline-based care can improve symptom control, reduce exacerbations, and ultimately enhance quality of life for pediatric patients. Moreover, the significant increase in referrals to specialists implies that the program encourages comprehensive care, ensuring complex cases receive the expertise they need. Overall, these improvements can lead to more effective, personalized care and better health outcomes for children with asthma. These findings suggest that VPS can effectively enhance adherence to asthma management protocols, potentially leading to improved patient outcomes through more precise diagnosis and individualized treatment.

ACKNOWLEDGEMENTS

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