Effectiveness of Online Medical Education at Improving Type 2 Diabetes Management

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Introduction

The standards of care for type 2 diabetes (T2D) management are continuously evolving to reflect new clinical safety and efficacy data. Published in March 2013, the AACE *Comprehensive Diabetes Management Algorithm Consensus Statement* provided an updated framework for the comprehensive management of patients with T2D. We sought to determine if an online educational intervention could improve the knowledge and understanding of internists about the place of modern oral antihyperglycemic agents in T2D management, according to recent guideline updates.

Methods

Instructional Design: Video Panel Discussion

An online educational activity was presented in the form of discussions among multidisciplinary experts in T2D. The format used to deliver the education included a video-based roundtable panel discussion, conducted by expert faculty using synchronized slides, with built-in peer response to encourage participant interactivity and feedback. For learners wishing to view the program offline, a transcript and slides were made available for downloading/printing. In addition, the activity was available on the Medscape Mobile application, ensuring real-time access by the many clinicians who rely on mobile devices for education. The activity launched online on January 21, 2014 and data were collected for 64 days.

Assessment Method: Linked Learning Assessment (LLA)

An LLA compares individual participants' paired responses to questions before exposure to educational content (pre-assessment questions) with responses to the same questions after participation in the educational activity (post-assessment questions). The LLA shows the overall effect of the educational activity. With this method of analysis, participants serve as their own controls. Answers to pre-assessment questions indicate what participants know at baseline before they participate in the activity. Responses to the repeated post-assessment questions indicate what participants have learned from the activity. Only participants who answered every assessment question are included in this analysis. Each question in the LLA is directly related to the learning objectives of the educational activity.

Statistical Analysis

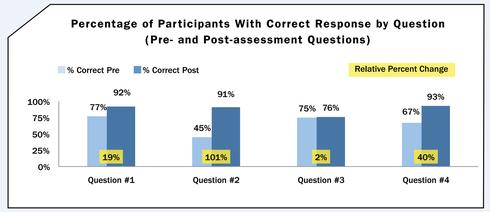
For all questions combined, the effect size was calculated by comparing pre-assessment means and post-assessment means of linked learners to show the size of the effect of the educational intervention. Effect sizes (calculated using Cohen's D) greater than 0.8 are large, between 0.8 and 0.4 are medium, and less than 0.4 are small. A paired 2-tailed t-test was used to assess whether the mean pre-assessment score was different from the mean post-assessment score. A Pearson's χ^2 statistic was used to determine significance. *P* values are shown as a measure of significance; *P* values less than 0.05 indicate a statistically significant result. Categories of participant responses are defined in the table below.

Participant Response Categories

Category	Definition
Improved Learners (green in pie chart)	Any incorrect response on pre-assessment, correct response on post-assessment
Reinforced Learners (blue in pie chart)	Correct response on both pre-assessment and post-assessment
Unaffected Learners (purple in pie chart)	Any incorrect response on post-assessment (with either correct or incorrect response on pre-assessment)

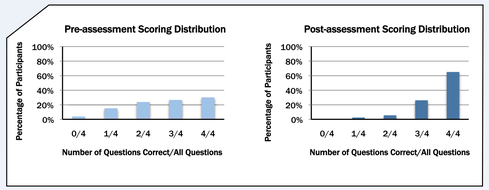
Results

Improved knowledge and competence by internists
(n=427; *P* <.05; overall large effect size of 0.89)



Scoring Distribution: Pre-assessment and Post-assessment

While only 129 (30%) participants answered all 4 pre-assessment questions correctly, 278 (65%) answered all questions correctly on the post-assessment.



Question #1

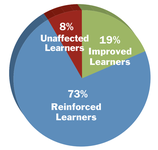
Of the following classes of anti-hyperglycemic agents, which is the most recent addition to the 2013 American Association of Clinical Endocrinologists' (AACE) Glycemic Control Algorithm?

(Correct answer is highlighted in yellow.)

	Internists (n = 427)	Pre-assessment % (n)	Post-assessment % (n)
A	Dipeptidyl peptidase-4 (DPP-4) inhibitors	13% (55)	6% (27)
B	Glucagon-like peptide-1 (GLP-1) receptor agonists	6% (27)	1% (4)
C	Sodium-glucose cotransporter-2 (SGLT-2) inhibitors	77% (329)	92% (393)*
D	Glucokinase activators	4% (16)	1% (3)

*P <.05

Linked Learning Education Effect



Question #2

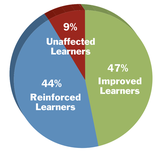
Which of the following is an adverse event reported in clinical trials with SGLT-2 inhibitor treatment?

(Correct answer is highlighted in yellow.)

	Internists (n = 427)	Pre-assessment % (n)	Post-assessment % (n)
A	Hypoglycemia	19% (81)	2% (7)
B	Heart failure hospitalization	21% (89)	6% (24)
C	Weight gain	15% (63)	1% (6)
D	Genital infections	45% (194)	91% (390)*

*P <.05

Linked Learning Education Effect



Question #3

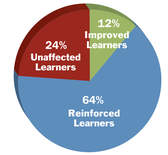
Which of the following is true regarding the use of DPP-4 inhibitors in patients with type 2 diabetes?

(Correct answer is highlighted in yellow.)

	Internists (n = 427)	Pre-assessment % (n)	Post-assessment % (n)
A	DPP-4 inhibitors are weight-neutral	75% (320)	76% (326)*
B	DPP-4 inhibitors can be used in patients with a personal or family history of pancreatitis	8% (33)	15% (66)
C	DPP-4 inhibitors have been shown to increase cardiovascular event rates	9% (40)	5% (22)
D	DPP-4 inhibitors may increase hypoglycemia when used as monotherapy	8% (34)	3% (13)

*P =.632

Linked Learning Education Effect



Question #4

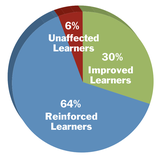
To what extent do DPP-4 inhibitors reduce HbA1c?

(Correct answer is highlighted in yellow.)

	Internists (n = 427)	Pre-assessment % (n)	Post-assessment % (n)
A	By 0.1% to 0.2%	4% (15)	3% (14)
B	By 0.5% to 0.9%	67% (284)	93% (398)*
C	By 0.7% to 2%	18% (76)	3% (11)
D	By 1% to 2%	12% (52)	1% (4)

*P <.05

Linked Learning Education Effect



Disclosure

Larkin, Le: nothings to disclose.

Bloomgarden: speaker/consultant fees from AstraZeneca plc., Janssen Pharmaceuticals, Inc., Merck & Co., Inc., and Novo Nordisk A/S; speaker fees from Santarus, Inc.; stock dividends and consultant fees from Novartis AG; and stock dividends from Hospira, Inc., Pfizer Inc., St. Jude Medical, Inc., and Zoetis.

Notes

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Conclusion

- This study demonstrates the success of a targeted educational intervention and access to the right physician audience (those at the forefront of diabetes care) on improving the knowledge and understanding of internists on the place in therapy of modern oral agents to treat T2D according to recent guideline updates.
- The large sample size of physicians included in this study and the statistically significant improvements demonstrate the benefits of educating a large audience base with aptly designed educational activities using adult-learning principles.

Source of Support

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