



IMPACT OF AN EDUCATIONAL INITIATIVE ON APPLIED KNOWLEDGE AND ATTITUDES OF PHYSICIANS WHO TREAT SEXUAL DYSFUNCTION



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ABSTRACT

A randomized, blinded, multicenter, controlled study to assess the impact of a multiyear continuing medical education (CME) initiative on physician knowledge and behavior in the treatment of erectile dysfunction (ED). This study assessed the efficacy of CME and compared knowledge and attitude scores of participants in the Consortium for Improvement in Erectile Function (CIEF), to non-CIEF participants

A blinded, validated questionnaire and series of standardized patient (SP) case studies and attitude questions were given to CIEF participants, defined as those who demonstrated an interest in learning more about ED and who took at least one CME-certified program from the CIEF website and non-CIEF participants, defined as those who took at least one CME-certified program on ED from any organization other than CIEF

The primary outcome was a comparison of subjects' scores who participated in at least one CIEF program to non-participants in CIEF programs. Subjects were also compared based on SP case scores, attitude scores, specialty, years in practice, age, and gender. SAS v9.1 analysis of variance model was used by an independent consultant

UROs scored higher on SP cases compared with PCPs ($P=.0039$); however, as a result of participating in CIEF programs, PCPs trended toward more comparable scores to UROs; $P=.23$ for SP case #2 that was clinically less complex and $P=.19$ for SP case #3 that was more complex. In the other 2 cases, the gap was reduced; however, UROs scored better than PCPs

PCPs in CIEF ($n=23$) had significantly higher SP case scores compared with non-CIEF PCPs ($n=10$); 216.6 vs 191.0, respectively ($P=.0437$)

PCPs in CIEF also demonstrated a significantly greater level in mean attitude scores compared with UROs, 10.82 vs 8.15, respectively ($P<.0001$)

Both PCPs and UROs scored higher after participating in CIEF programs than those clinicians who participated in non-CIEF programs. In addition, clinicians participating in more CIEF programs scored higher than those participating in fewer CIEF programs

Urologists consistently scored better than PCPs, indicating a higher baseline level of knowledge. This educational gap was significantly reduced when PCPs participated in CIEF programs

The study demonstrated that PCPs who took more CIEF courses were almost as knowledgeable as UROs on the subject of ED

Longitudinal, disease-specific CME initiatives are valuable in that they positively impact the knowledge and behavior of participating physicians, potentially conferring clinical benefits toward patient outcomes

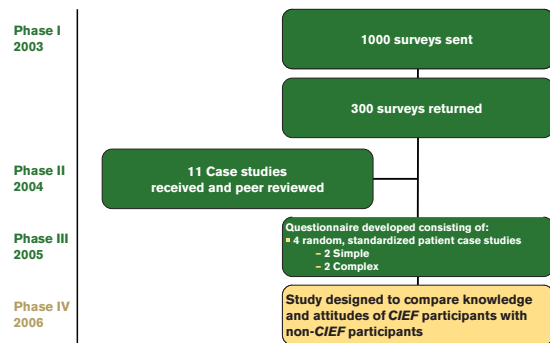
Phase I - Survey to assess the knowledge and attitudes of CIEF participants through a self-evaluation tool

Phase II - Physicians submitted virtual case studies based on clinical experience about specific issues related to ED. 11 case studies were received, edited, and posted on the CIEF website for use in educational venues

Phase III - A validated questionnaire was developed. The questionnaire consisted of 4 random SP case studies, 2 considered "simple" and 2 considered "complex." The results of this validation study confirmed that the questionnaire was a reliable and consistent instrument

Phase IV - Controlled study designed to compare a) knowledge and b) attitudes of CIEF participants with non-CIEF participants and to c) investigate the potential benefit of the CIEF program for PCPs compared with UROs (See Figure 1)

Figure 1: Study Design



Methods

Invitations were distributed via mail, E-mail, and fax broadcast to PCPs and UROs. Participants logged on to a Web page with their unique login identification for direct entry of responses. The questionnaire consisted for 4 unique patient case studies:

Simple case studies

SP #1, Performance Anxiety in the Transition to a New Partner
SP #4, Switching from Short-acting to Long-acting PDE5 Inhibitors

Complex case studies

SP #2, Benign Prostatic Hyperplasia (BPH)/Lower Urinary Tract Symptoms (LUTS)
SP #3, Cardiovascular disease

Each of the 4 SP case studies had multiple-choice knowledge and attitude-based questions. There was more than one correct answer to each question; participants were asked to select the one "best" answer based on their clinical judgment and/or educational programs in which they may have participated. Answers were weighted wrong=0, somewhat wrong=2, not right nor wrong=4, somewhat right=8, right=12. Answers were also ranked from best to worst and assigned a corresponding value of 10, ..., 3, 2, 1, and 0 (10 being the best), assuming that there may be more than 1 correct answer to each question in clinical practice

CIEF participants were defined as those who took at least one CME-certified program on men's sexual health from the CIEF website; non-CIEF participants or control group were defined as those who took at least one CME-certified program on men's sexual health from any organization other than CIEF. These groups were also further broken down by the number of programs taken

Study participants were grouped as follows:

- Group 1: ≥ 2 CIEF (subjects who participated in more than 2 CIEF programs)
- Group 2: 1 CIEF (subjects who participated in 1 CIEF program)
- Group 3: Non-CIEF (control group)

Total scores for each SP case, as well as the overall score for all cases, were compared across each of the following groups below:

- Number of non-CIEF educational activities
 - Grouping A: Group 1, ≥ 2 ; Group 2, 1; Group 3, 0
 - Grouping B: Group 1, ≥ 1 ; Group 2, 0
 - Grouping C: Group 1, ≥ 5 ; Group 2, ≤ 4
 - Number of CIEF educational activities
 - Grouping D: Group 1, ≥ 2 ; Group 2, 1; Group 3, 0
 - Grouping E: Group 1, ≥ 1 ; Group 2, 0
 - Physician categories
 - Group 1: UROs
 - Group 2: PCPs
- Benefit of CIEF program as measured by the total score of the case studies
- Cumulative benefit of the CIEF program
- CIEF participants' total score compared with that of non-CIEF participants

Total scores (4 questions with 0=, 1=, $>0\%$ up to 30%, 2=, $\geq 30\%$ up to 60%, 3=, $\geq 60\%$ up to 100%, 4=, 100%) for the attitude questions were analyzed across CIEF and non-CIEF classifications and by physician category

SAS v9.1 PROC MIXED analysis of variance (ANOVA) model was used to compare total scores of knowledge questions and attitude questions across various groups by an independent consultant

RESULTS

120 physicians participated in this study. There were 12 women and 108 men, with an average age of 50.6 and 53.1 years, respectively. The average number of years in practice was 19.8 and 20 years for PCPs and UROs, respectively

The distribution of participants with CIEF and non-CIEF experience is shown in Table 1

Table 1. Distribution of CIEF and non-CIEF Experience, n (%)

CIEF	Non-CIEF			Total
	0	1	≥ 2	
0	7 (5.8%)	2 (1.7%)	7 (5.8%)	16 (13.3%)
1	3 (2.5%)	1 (0.8%)	8 (6.7%)	12 (10.0%)
2	16 (13.3%)	8 (6.7%)	68 (56.7%)	92 (76.7%)
Total	26 (21.7%)	11 (9.2%)	83 (69.2%)	120 (100.0%)

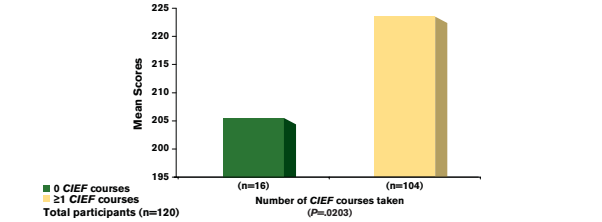
Knowledge Total Score - Case studies 1, 2, and 3 were each followed by 7 knowledge questions, whereas case study 4 was followed by 6 questions. After applying the ranking system described previously, a total score was calculated for each participant

ANOVA model was then employed to compare the participants with various levels of CIEF experience (Groupings D and E). Results, displayed in Table 2, demonstrated the benefit of CIEF courses in improving physicians' knowledge in treating ED. The benefits of CIEF courses were demonstrated to be significant ($P=.0203$) when mean (SD) total scores for physicians with no CIEF experience 205.50 (43.38) were compared with those with one or more CIEF courses 223.53 (25.65) as displayed in Figure 2

Table 2. Case Studies Total Score Comparisons

Mean (SD) 0 CIEF Courses	Mean (SD) 1 CIEF Courses	Mean (SD) ≥ 2 CIEF Courses	ANOVA Model P
205.50 (43.38)	229.00 (17.4)	222.92 (28.55)	.0533
	Mean (SD) 0 CIEF Courses	Mean (SD) ≥ 1 CIEF Courses	
	205.50 (43.38)	223.53 (25.65)	.0203

Figure 2: Phase IV-Total Score Comparisons of Case Studies



Physicians with no CIEF experience, with 1 CIEF course experience, and with 2 or more CIEF course experiences were compared. While the results had a positive trend, statistical superiority of the 2 or more CIEF courses (mean=222.82) over 1 CIEF course (mean=229.00) could not be fully demonstrated ($P=.0533$)

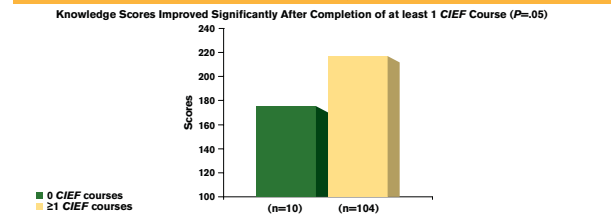
Knowledge Total Score-CIEF and Non-CIEF

A secondary objective of the study was to compare the CIEF and non-CIEF programs to ensure consistency of the CIEF program. Table 3 provides the means and standard deviations for this comparison and Figure 3 depicts the significant ($P=.05$) improvement in total knowledge scores after completion of at least 1 CIEF course

Table 3. Mean and SD for CIEF and non-CIEF Knowledge Questions

CIEF	Non-CIEF			ANOVA Model	P
	0	1	≥ 2		
0	204.71 (16.31)	175.50 (96.87)	214.88 (49.73)	CIEF	.05
1	222.67 (21.55)	217.00 (—)	232.86 (16.55)	Non-CIEF	.03
2	214.06 (31.75)	208.75 (35.23)	226.53 (23.37)		

Figure 3: Phase IV-Knowledge Total Scores



Keeping in mind the lack of adequate sample size in some cells of the table, the lowest mean was achieved when there were no CIEF courses taken (mean=175.50) and the highest scores was achieved when participants took advantage of both CIEF and non-CIEF courses (means=232.86 and 226.53, respectively). Statistical P-values from the ANOVA model indicate that both CIEF and non-CIEF courses significantly improve participants' knowledge in dealing with ED patients

Knowledge Total Score-Simple vs Complex Cases

There was a definite improvement in overall score as participants were exposed to more CIEF courses. The total score encompassing all 4 cases demonstrated the CIEF benefits (comparing 0 with ≥ 1 CIEF course; $P=.02$; comparing 0 to 1 with ≥ 2 CIEF courses, $P=.05$)

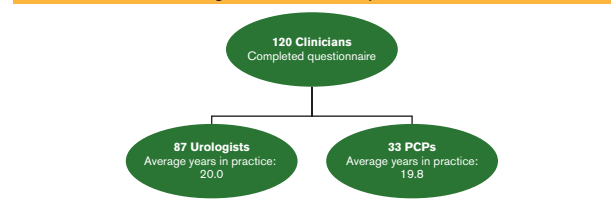
UROs scored higher on SP cases compared with PCPs ($P=.0039$); however, as a result of participating in CIEF programs, PCPs trended toward more comparable scores to UROs; $P=.23$ for SP case #2 that was clinically less complex and $P=.19$ for SP case #3 that was more complex. In the other 2 cases, the gap was reduced; however, UROs scored better than PCPs

Effect of Specialty

In general, UROs are more knowledgeable than PCPs in treating ED patients. One of the objectives of this study was to explore the effect of CIEF courses on closing this educational gap

(See Figure 4) The mean (SD) knowledge total scores were 208.82 (33.77) and 225.79 (25.77) for all PCPs and all UROs, respectively. However, with only one CIEF course, the PCPs mean (SD) improved to 230.22 (15.45) greater than those of the UROs

Figure 4: Phase IV Participants



ANOVA model with only specialty (PCPs vs UROs) effect in the model showed a highly significant difference ($P=.0039$), but when the model was adjusted for the effect of the CIEF courses, the significance was reduced greatly ($P=.0379$). This exercise clearly proves the positive effect of CIEF courses in significantly reducing the knowledge gap between UROs and PCPs in treating ED patients

Attitudes Total Score

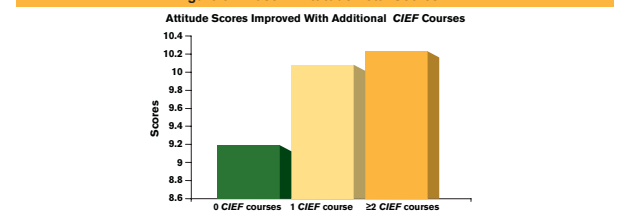
Participants were asked to determine the frequency at which q1) they ask patients about sexual health; q2) they use a questionnaire to manage sexual health; q3) they engage patients in a conversation regarding sexual health; and q4) if they feel that ED is a significant medical condition that should be managed

Responses were ranked as previously described and analyzed. Participants' attitudes about their professional practice benefited from participants in CIEF programs, as indicated by improvement in the average total score (Table 4 and Figure 5). There is no indication of superiority of CIEF programs over standard non-CIEF programs, as seen by the nearly equivalent total scores. When individual attitude questions were considered, particularly for the question specifically regarding ED, a positive trend was observed

Table 4. Attitudes Total Scores

Mean (SD) 0 non-CIEF Courses	Mean (SD) 1 non-CIEF Course	Mean (SD) ≥ 2 non-CIEF Courses
9.38 (3.32)	11.64 (2.50)	10.10 (3.03)
Mean (SD) 0 CIEF Courses	Mean (SD) 1 CIEF Course	Mean (SD) ≥ 2 CIEF Courses
9.19 (3.19)	10.08 (2.43)	10.23 (3.14)
Mean (SD) UROs	Mean (SD) PCPs	
8.15 (2.37)	10.82 (3.01)	

Figure 5: Phase IV-Attitude Total Scores



Another strong indication that CIEF courses improve physicians' attitudes in their daily practice of treating ED patients was when attitude total scores were compared between PCPs and UROs. This comparison was highly significant ($P<.0001$) as evident from the mean (SD) of 8.15 (2.37) vs 10.82 (3.01) for UROs and PCPs, respectively. These results clearly indicate that PCPs are positively influenced by the CIEF courses and, in fact, score higher than their URO counterparts in treating ED patients

LIMITATIONS

The total sample size of this study is relatively small. This disadvantage in sample size made it more difficult to quantify the full benefits of the CIEF program on PCPs. This study was undertaken as a multiyear longitudinal study, thus pretests were not utilized at the start of the study, which made it difficult to assess participants' baseline knowledge of ED

CONCLUSIONS

- Both PCPs and UROs scored higher after participating in CIEF ED educational programs than those clinicians who participated in non-CIEF ED educational programs
- In addition, clinicians participating in more CIEF programs scored higher than those participating in fewer CIEF programs
- As expected, urologists consistently scored higher than PCPs, indicating a higher baseline level of knowledge base about ED. However, this educational gap was significantly reduced in PCPs who participated in CIEF programs
- The study demonstrated that PCPs who took more CIEF courses were almost as knowledgeable as UROs on the subject of ED
- Longitudinal, disease-specific CME initiatives are valuable because they positively impact the knowledge and thus the behavior of participating physicians, potentially conferring clinical benefits toward patient outcomes

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