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Preceptor Training: Evaluation of an On-line Educational Module to Improve Preceptor Feedback

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Abstract

Purpose: Effective feedback delivery is critical to behavior modification and skill improvement in novice learners and athletic training programs often use annual training to teach preceptors to develop feedback skills. The purpose of this research project was to evaluate the effectiveness of an on-line asynchronous educational module for improving feedback delivery. **Method:** We used a single cohort, repeated measures design (pre, post, post-post) and an eAuthoring tool (Softchalk$^{©}$) and online assessments (Qualtrics® Provo, UT) to evaluate the educational module. Preceptors (n=351) from 17 post-baccalaureate programs began the study; 48 completed all 3 assessments. We delivered a content validated lesson and assessments using various learning theories including video demonstrations with paired reflections. The desired outcome was to enhance the knowledge of effective feedback characteristics to be used in practice. The pre-test assessed self-reported feedback behaviors on a Likert Scale and knowledge (score=25). The immediate post-test reassessed feedback knowledge. At least 8 weeks following completion of the module, participants were asked to reassess feedback delivery behaviors. Throughout the process, participants provided a definition of "effective feedback" scored on 7 key criteria for effective feedback delivery. Descriptive statistics and paired t-tests were used to analyze the data and significance was set at Pa-priori. **Results:** Significant improvements (P-3.298 P=.001, Cohen's d=.889). There were no other significant differences between pre-test and follow-up behaviors (P>.05), as participants generally agreed they performed effective feedback behaviors (mode=4) at both time points. **Conclusions:** Behaviors regarding effective feedback were not changed over the long-term, which may have been a result of the method of performance feedback. Preceptor training is both a requirement and a need in effective athletic training clinical education. Future research should aim to identify mechanisms to improve preceptor feedback and confirm preceptor perceptions through student evaluations.

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ABSTRACT

Purpose: Effective feedback delivery is critical to behavior modification and skill improvement in novice learners and athletic training programs often use annual training to teach preceptors to develop feedback skills. The purpose of this research project was to evaluate the effectiveness of an on-line asynchronous educational module for improving feedback delivery. **Method:** We used a single cohort, repeated measures design (pre, post, post-post) and an eAuthoring tool (Softchalk©) and online assessments (Qualtrics® Provo, UT) to evaluate the educational module. Preceptors (n=351) from 17 post-baccalaureate programs began the study; 48 completed all 3 assessments. We delivered a content validated lesson and assessments using various learning theories including video demonstrations with paired reflections. The desired outcome was to enhance the knowledge of effective feedback characteristics to be used in practice. The pre-test assessed self-reported feedback behaviors on a Likert Scale and knowledge (score=25). The immediate post-test reassessed feedback knowledge. At least 8 weeks following completion of the module, participants were asked to reassess feedback delivery behaviors. Throughout the process, participants provided a definition of "effective feedback" scored on 7 key criteria for effective feedback delivery. Descriptive statistics and paired t-tests were used to analyze the data and significance was set at $P<0.05$ *a-priori*. **Results:** Significant improvements ($P<.001$) of average scores between the pre- ($17\pm3/25$) and post-assessments ($20\pm3/25$) were identified. For the definition of effective feedback, participants improved from identifying 1 to 2 of the 7 criteria in the post-test ($P<.001$, Cohen's d=1.749). When comparing pre-test behaviors to 8-week follow-up, we found a significant improvement in the behavior of giving specific and focused feedback ($t(41)=-3.298$ $P=.001$, Cohen's d=.889). There were no other significant differences between pre-test and follow-up behaviors ($P>.05$), as participants generally agreed they performed effective feedback behaviors (mode=4) at both time points. **Conclusions:** Behaviors regarding effective feedback were not changed over the long-term, which may have been a result of the method of performance feedback. Preceptor training is both a requirement and a need in effective athletic training clinical education. Future research should aim to identify mechanisms to improve preceptor feedback and confirm preceptor perceptions through student evaluations.

Keywords: eLearning, knowledge, behavior

INTRODUCTION

Health care professionals, such as nurses and physicians, have identified feedback as a prominent educational tool commonly used in clinical practice.[1–3] In most settings, feedback is delivered from the superiors to new hires or trainees and interns through verbal and written performance evaluations.[2] Van de Ridder et al[2] defined feedback during clinical education as "specific information about the comparison between the trainee's observed performance and a standard, given with the intent to improve the trainee's performance." Feedback is delivered in a variety of ways and can shape student performance.[3,4] The ability to provide effective feedback reinforces positive behaviors in the workplace and corrects poor performance.[4] Timely feedback encourages self-regulation and allows the learners to take control of their education in order to create more meaningful connections.[5]

Preceptors, critical purveyors of feedback, play a vital role in the socialization of heath care students entering the profession during clinical education.[1,6–10] During the socialization period, health care students will learn the particulars of daily life as a professional and will develop habits that are likely to shape the performance and attitudes towards their career.[3,4,6,8] The development of preceptors' communication and feedback delivery skills should be routinely evolving in clinical practice to avoid stagnant procedures and increase the likelihood of positive clinical experiences.[2–4] To be an effective preceptor in the health care industry, preceptors commonly undergo annual training to develop their skills as a clinical educator.[11–13] Preceptor education on clinical teaching of skills and behaviors is a common practice through formal (conventions, courses, lectures, etc.) and informal courses (conversations or mentorship) across various health care professions.[10,11] In athletic training, the Commission on Accreditation of Athletic Training Education (CAATE) creates standards that educational programs must incorporate to ensure quality. These standards are designed to indicate the minimum requirements of a program while still allowing for programmatic autonomy.[14] Concerning preceptor training, standards 32 and 33 require regular and ongoing communication with preceptors as well as annual training and evaluation of preceptors and clinical sites,[14] with the individual program defining the nature and delivery method of communication and annual training. While some athletic training programs choose to meet in-person with their preceptors to deliver this communication and annual training, others use online education as their sites may be abroad or located some distance away from the campus.[15] Online learning, or eLearning, is the use of internet and technology in order to advance the knowledge and/or skills of individuals that allows learners to have control of content, time, accessibility, and pace of learning.[16] Many health care professions have used eLearning as a delivery method for professional education as a form of formal education.[17,18] E-Learning has been found to be an effective tool in delivering content to a variety of learners in a population or across populations, with web-based tutorials contributing to the effectiveness of retained knowledge.[16,19] Further, eLearning modules could be used to meet the requirements for CAATE standards 32 and 33.

Preceptor development regarding feedback and preceptor effectiveness should be a priority for program administrators.[20] Previous literature in athletic training, relative to preceptor training, has focused on what programs do as their annual training and what preceptors perceive as important characteristics, skills, and behaviors for someone in their position.[3,15,20] Preceptor development has been taught through formal and informal education, with feedback accounting for a small portion of the training. Previous studies of feedback in athletic training and nursing have shown how feedback is critical to clinical education; however, the value of feedback and its regular use is variable.[2,3,6,8] Of those studies that have explored effective feedback focused on scoring, or evaluation, of students by setting clear clinical skill goals and education of the preceptors to evaluate effectively, is only part of the requirements for effective feedback.[15] The purpose of this investigation was to evaluate the effectiveness of an on-line, asynchronous educational module for improving knowledge of best practices for feedback delivery in athletic training clinical experiences and self-reported feedback practices.
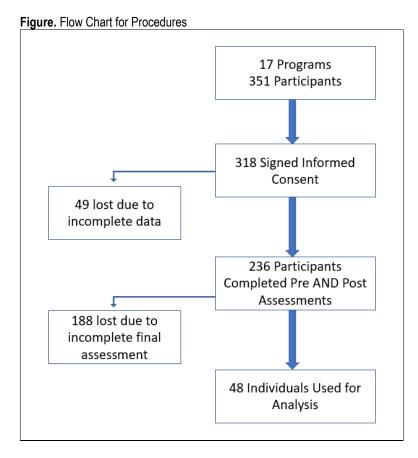
METHODS
Design
This study was a single cohort, repeated measures design that aimed to evaluate the effectiveness of an eLearning module on effective feedback, feedback delivery and self-reported behavior of feedback use of preceptors in clinical education. This was measured through self-reported Likert scales from the preceptor and a knowledge assessment. This research was deemed exempt by the Indiana State University Institutional Review Board. The STROBE[21] guidelines were used to ensure the reporting of this observational research.

Programs and Participants
Recruitment was conducted for interested programs through the Association for Athletic Training Education (AATE) that were willing to adopt the on-line, asynchronous educational module for feedback delivery as part of their annual training. Annual training for preceptors is required by the CAATE standards. As incentive for participation in the study, 1.5 continuing education units were offered for completion of the educational module.

Initially, 22 post-baccalaureate athletic training programs were contacted through an email advertisement from the AATE listserv. Specifically, professional masters' programs that were in good standing with CAATE and in AATE were targeted. Each program with a cohort engaging in clinical experiences during the Fall 2021 semester were included in this study. Programs agreed for their preceptors to complete an asynchronous online education module regarding feedback delivery as part of their required annual training. Preceptors were not required to participate in research to receive credit for the required annual training. CECs were asked to administer emails on behalf of the primary investigator (PI) to any preceptors who will have at least one athletic training student in the Fall 2021 semester.

From the initial contact list, 17 programs engaged in the training with 351 preceptors participating in the educational module. Of these, 318 preceptors signed the informed consent for their data to be used in the study. Forty-nine individuals' initial data was incomplete, and 236 participants completed the pre- and post- assessments. For the follow-up assessment, 48 individuals completed all three assessments to be used for comparative analysis across the various time frames for knowledge and behavioral changes (Figure).

Figure. Flow Chart for Procedures

Instruments
The participants completed pre-, post-, and 8-week follow-up intervention assessments delivered through a web-based platform (Qualtrics®, Provo, UT) that assessed knowledge retention and the preceptors perceived effectiveness in delivering feedback. Once data were collected, a qualitative and quantitative analysis occurred determining the effectiveness of both the preceptors' ability to provide quality feedback and the effectiveness of the educational tool designed for this study.

Educational Tool
The educational tool designed for this study was established from the abundance of available literature on effective feedback in clinical education.[4-8,10,28,29] Two content experts with doctoral training in curriculum and instruction, experience as Coordinators of Clinical Education, and substantial publications in clinical education and feedback (N=34) evaluated the content for accuracy, clarity, delivery feasibility and navigation. The module (Table 1) was delivered via URL that granted access to the education module and assessment via SoftChalk Cloud© (LLC, San Antonio, TX). Softchalk is an eAuthoring tool providing for chapters/modular

delivery of readings and interactive demonstration videos. This tool delivered information on learning theories, effective feedback characteristics, and delivery methods for feedback that support and enhance the clinical education experience and was designed to be integrated as one part of an overall preceptor training program. Video examples and reflection prompts were embedded into the module that demonstrated feedback behaviors. Participants read through the material and engaged in in the reflection questions. These questions would provide feedback via standard, prepared answers regardless of the preceptor's response. For example, participants reviewed a video in which a clinical taping skill was performed by the student. In the video, the preceptor provided real-time feedback to assist in the skill being performed. The participants were then asked: "In what ways does this preceptor provide effective feedback? Is there any further action that could be taken to improve this interaction?" Participants provided an open-ended answer and upon submission the standardized response was revealed. We chose to use a standardized response as the mode of feedback to be frequent (after each question/response), well-timed (immediate), and reflective (the ability to see their own response in comparison to a "correct" response side by side).

Table 1. Effective Delivery of Feedback in Clinical Practice Settings

Module Section	Estimated Time	Main Points of the Section	Interactive Portion
Educational Learning Theories	20-30 minutes	• Overview of effective educational and learning theories • Application of theories as a preceptor	*Visual representations of each theory accompanied by a caption describing the visual.*
Formative vs Summative Assessment	10-15 minutes	• Difference between types of assessment • Examples of how to include assessment as a preceptor	None
Feedback Delivery	20-30 minutes	• Best practices for feedback delivery and feedback styles • Application of effective feedback in clinical scenarios	None
Summary of Effective Feedback	5-10 minutes	• Summary of feedback sections for review	None
Video Feedback Scenarios	30-45 minutes	• Examples of effective and ineffective feedback • Opportunity to reflect and respond to recorded scenarios • Application of knowledge of feedback delivery in a simulated encounter	Recorded videos of simulated feedback scenarios accompanied by free-response questions. Example Questions: *What feedback might you provide to this student who seems bored or disengaged?* *Documentation skills do not typically receive feedback or practice in the clinical setting. In what ways, if any, does the preceptor provide adequate feedback in this scenario? How could this scenario look different?*

Assessments

Preceptors took a series of 3 assessments, all of which were administered through Qualtrics®. Pre-, post- and 8-week follow up intervention assessments were content and face validated. The assessments consisted of multiple choice and open-ended questions that asked the preceptor about the educational material in the module to evaluate the level of knowledge retention at each follow-up. The use of reflective learning in preceptor education was intentionally included to develop self-awareness as a clinical educator.[22] A Likert scale scoring from "1"-strongly disagree to "5"-strongly agree was used to determine if and how often feedback was currently being used in practice during each phase of assessment. During the pre-assessment, demographic information was collected including names, years of precepting, clinical setting and previous knowledge regarding feedback. The pre-assessment also focused on evaluating preceptors' initial knowledge of effective feedback and self-perceived use of feedback in clinical practice to gather a baseline for comparison. The post-assessment was designed to evaluate preceptor knowledge immediately after completing the educational module to measure knowledge transfer. The 8-week follow-up assessment was designed to measure knowledge retention of preceptors over time. The content of the pre- and post-assessments measured knowledge of feedback and retention, while the pre-, post- and follow-up assessments measured self-perceived behaviors and ability to identify effective feedback characteristics.

Table 2. Knowledge Assessment Scores n=48

Assessment	Mean ± SD
Pre-assessment	17.15 ± 3.00
Post-assessment	18.53 ± 5.37

Assessment was out of 25 total correct points

Procedures

Starting in July 2021, the CECs were asked to distribute a series of emails sent from the research team. The first email was used to inform the preceptor about the module and ask them to complete the informed consent and pre-module assessment. Then the CEC distributed the link to the educational module to all preceptors who would precept a student in the Fall 2021 semester.

Preceptors completed the educational module and immediately after the completion of the educational module, regardless of response to the informed consent, the preceptors would then use the link, embedded at the end of the module, to take the post-assessment. This assessment evaluated immediate knowledge transfer of learning theories, effective feedback styles and delivery, and reflect on the use of feedback in the clinical setting with the new knowledge. Upon completion of the pre-assessment, educational module and post-assessment, a certificate of completion was provided to the preceptor. Programs and preceptors were given until the end of August 2021 to complete the educational module. At 6 weeks after the closure of the module, we reminded CECs about the follow-up assessments. Eight weeks after the module closed, we asked the CECs to forward an email to the preceptors as a final reminder to complete a follow-up assessment.

Data Analysis

Using the statistics analysis software SPSS® (version 26; IBM Corp., Armonk, NY), we calculated descriptive statistics for the pre-assessment, post-assessment, and follow-up assessments. Quantitative analysis consisted of mode, frequency of the mode, mean and standard deviation of the self-reported feedback behaviors. The range, mean, and standard deviation were calculated for the knowledge assessment scores (out of a total of 25). An a-priori power analysis indicated that we needed 45 participants to conduct our statistical analyses (comparing pre-, post-, follow-up). We used paired sample t-tests to analyze the data from the preceptors' feedback knowledge, comparing the scores before, and immediately after intervention. Repeated measures ANOVAs were used to compare the perceptions of feedback use in the clinical setting pre- and the 8-week follow-up after the intervention. Significance was set at $P<.05$ *a-priori*.

Using a deductive coding process, the following definition of effective clinical feedback was used: "The person providing feedback should *create a safe learning environment* that begins with *self-reflection* and may include privacy, especially for critical feedback. Effective Feedback is *frequent, well-timed, specific*, and aims to *bridge the gap* between clearly communicated expectations and performance., resulting in *goal setting* for future performance." For this question during each assessment phase, scores were designated as correct, partially correct, and incorrect basis. A correct answer was given if ≥ 6 key ideas were included in the definition of feedback provided by the preceptors. Partially correct was deemed as definitions that carried between three and five of the ideas, and incorrect answers had ≤ 2 of the key ideas.

RESULTS

The 48 participants that completed all three assessments had several years of experience as a preceptor (7±8y) and worked primarily in secondary school (n=20, 41.6%) and college settings (n=18, 37.5%). We calculated average scores of the pre- and post-assessments and identified significant improvements (P<.001) between the pre- (17±3) and post-assessments (19±5) (Table 2). When comparing pre-test behaviors to 8-week follow-up, we found a significant improvement in the behavior of giving specific and focused feedback (P=.001, Cohen's d=.889) as shown in Table 3. There were no other significant differences between pre-test and follow-up behaviors (P>.05), as participants generally agreed they performed effective feedback behaviors at both time points (mode=4, agree).

Table 3. Participants' Perceived Use of Feedback in Practice

Statement	Pre-assessment			Follow-up		
	Mean ± SD	Mode	Frequency of Mode	Mean ± SD	Mode	Frequency of Mode
I set aside time for education and debriefing with students in my clinical practice.	4.14±.74	4	22%	4.27±.77	4	25%
I give timely feedback on skills performed in the clinic.	4.30±.60	4	24%	4.40±.54	4	27%
Feedback is a consistent and normal part of student-preceptor relationship.	4.56±.50	5	24%	4.52±.62	5	28%
I provide feedback in a professional manner.	4.40±.54	4	24%	4.46±.50	4	26%
My feedback style encourages positive clinical learning.	4.37±.54	4	25%	4.40±.54	4	27%
I set clear expectations on how students will be evaluated.	3.79±.74	4	21%	4.00±.88	4	24%
The feedback I provide to students is specific to 1-2 behaviors exhibited.[b]	3.74±.79	4	20%	4.21±.75	4	25%
The feedback I provide to students is general in regards to their overall performance.	3.60±.93	4	21%	3.81±.77	4	24%
When I give feedback in a clinical setting, it is given in a non-judgmental tone and in a private/safe environment.	4.28±.67	4	24%	4.45±.54	4	24%
The feedback I provide facilitates self-reflection and self-appraisal from the students I work with.	4.19±.59	4	27%	4.23±.60	4	28%

[a] Level of agreement: 5=strongly agree, 4=agree, 3=neither agree nor disagree, 2=disagree, 1=strongly disagree
[b] Statistical analysis shows there was a significant improvement in this behavior where p≤.001.

As indicated by Table 4, participants improved from identifying a single key term (1±.89) of the 7 criteria to identifying two (2.06±1.81) key terms in the post-test (P<.001, Cohen's d=1.749) when defining effective feedback. In the pre-assessment, the most common themes that emerged were that participants identified feedback should be well-timed and should bridge the gap between expectations and performance. These were mentioned 10 times each within the 48 compared responses and were typically stated together. The other 4 themes in the definition were mentioned less frequently. During the post-assessment, participants were more likely to identify one or more themes within their response as well as create a definition that contained more than one theme. By the time participants completed the follow-up assessment, "well-timed" feedback was the dominant theme represented in their given definitions, but the average themes identified dropped back to 1.07±.1.00. This shows that a decline occurred over time from post- to follow-up assessments. Further, the data indicated that participants reverted to being unable to create definitions with two or more themes, similar to their answers before the educational module.

Table 4. Definition Key Themes n=44

Itemized Themes	Pre-Assessment	Post-Assessment	Follow-up Assessment
Create a safe learning environment	6	10	9
Self-reflective	7	12	8
Frequent	2	5	5
Well-timed	10	15	19
Specific	3	10	3
Bridge the gap	10	5	2
Goal setting	2	7	2
Individual Scores			
Max	3	6	5
Min	0	0	0
Average ± SD	1.00 ±.89	2.06 ± 1.81	1.07 ± 1.00

This table represents the total times the theme was provided in the definitions given by participants during the different assessment stages.

DISCUSSION

The aims of this study were to measure the effectiveness of an online, asynchronous educational module and improve the self-perceived behaviors of effective feedback by preceptors in clinical education. The findings of this research indicate that preceptors carry some knowledge of what effective feedback looks and sounds like in clinical practice. Whether or not individuals have formal education or training as being a preceptor or supervisor, they will inherently carry some knowledge and behaviors with them from their personal experiences.[23,24] With the implementation of annual training, or short-term single module training such as used in this study, preceptor knowledge of effective feedback and behaviors in clinical practice increases immediately after the module. This is shown through the pre- and post- knowledge assessment scores (Table 1) where on average, the preceptors scored higher when immediately tested. When determining the effectiveness of an online educational module, the educational tool appears to be effective in immediate knowledge retention. This increase in scores could be attributed to the type of assessment that was used. Multiple choice testing immediately after education can identify errors and fill gaps of incomplete knowledge; however, without customized, corrective feedback, long-term learning and retention may not be achieved.[25] It is not uncommon to see increased scores immediately after education,[25] including when delivered online.[26,27]

Incongruence between Perceptions and Behaviors

Within the educational module, several themes of effective feedback behaviors were discussed and used to create a definition of effective feedback.[4–8,10,28,29] During the scoring of the assessments, participants displayed the ability to identify effective feedback behavior when presented in a multiple-choice form, but were unable to produce the same behaviors in their provided definitions. The results show that before education on effective feedback behaviors, many preceptors were unable to successfully identify effective feedback delivery criteria. Immediately after the education, participants were able to provide a more inclusive definition that identified several of the themes that define effective feedback behavior. When compared to studies on online education that related pre- and post-assessments, this increase in knowledge can be attributed to the online module providing immediate feedback.[26,27] Several weeks after the educational module, however, participants were no longer able to describe effective feedback behaviors, which may indicate that their own behavior or effectiveness was reduced due to time or not reinforced through their own application.

One specific example of knowledge gap demonstrated by our participants surrounding efficiency in providing feedback. Our data show that preceptors perceive themselves as efficient in completing effective feedback (mode=4, agree) in both pre and follow-up assessments. However, the same population was unable to develop a definition that reflected those same behaviors (Table 3). In a study conducted with physicians, perceived knowledge was rated as high, but a knowledge assessment comparison suggested they were not as knowledgeable as they thought.[30] In psychology research, this is referred to as the Dunning-Kruger effect, whereby one overestimates their actual knowledge.[31] This phenomenon has been demonstrated in athletic training repeatedly, but not in reference to preceptor behaviors.[32–36]

When interpreting the data of this research, there is a notion that preceptors hold a current belief that they display effective feedback behaviors in clinical practice. This is indicated by their self-reported score of "agree" in the identified behaviors both before and after the educational module. It was hypothesized that after the educational module, self-perceived behaviors would have

decreased as the participants would have a clearer understanding of what effective feedback entailed. This idea is supported through research of how a post-assessment alone is not indicative of knowledge gain, rather how feedback is needed to inspire further pursuing education.[36] In this study, that was not the case. Furthermore, when asked to self-report behaviors several weeks after the educational module, preceptors showed improvement in only one of the behaviors, showing that long-term improvement of effective feedback use did not occur after the educational training. As the aim of this research was to improve the effectiveness in feedback for preceptors, the data would indicate that the educational module and subsequent assessments were ineffective in gauging self-perceived behaviors.

Mode of Module Feedback
The diminished performance relative to defining effective feedback in the follow-up assessment may be explained by our approach to feedback. Instead of customized feedback from the online module or module facilitators, standard responses were provided. Here is an example of the standard feedback:

> "*In addition to the answers that were suggested in your response, we have prepared answers that may add to the experience of feedback delivery. Providing effective feedback creates positive and meaningful experiences in the clinical setting. In this scenario, the preceptor provides timely feedback in the moment of the interaction and remains close in case there are questions. He is attentive and observes the student's behavior and performance directly.*
>
> *When making corrections or challenging the rational of the student, the preceptor used a calm and professional, instructive tone and allows the student to correct their mistake without destroying their self-confidence. This interaction correction occurs in live time, allowing the student to learn hands-on. After this interaction is concluded the preceptor can give specific feedback on the skills observed. Use of the reflective conversation feedback module could be used to ask the student to reflect on what went well, and what they feel they could improve on. Preceptor should affirm the strengths and help set actionable steps for improvement.*"

Regardless of what the participant wrote, the standard response was provided. Not providing individualized feedback with critical comparison between the standard and submitted responses could have hindered learning. Although an intentional research design and theoretically supported choice about the timeliness of feedback, the standard response feedback neither offered reinforcement of accurate reflections, nor correction to inaccurate reflections. Specifically, the lack of corrective feedback was likely what fell short,[23,25,37] thus behavior change or long-term knowledge transfer did not occur. Novice individuals need affirmation along with their feedback to yield behavior change, while more competent individuals require behavior or performance critique to produce lasting change.[38] We can deduce long-term behavior changes were not observed after 8 weeks because of the lack of direct critique, much like the direct observation suggested by Groh, et al.[23]

Scaffolding
Unlike in other studies where assessments were given in increments, re-exposing the participants to the material each time, our study may not have provided enough exposure, thus decreasing the likelihood of long-term retention.[26,37] Ultimately, this finding suggests that one time preceptor training on feedback is not sufficient to improve self-reported feedback behavior, but even more importantly, it is possible no topic of effective precepting can be taught in one session without sufficient scaffolding.[37,39] The lack of positive results in this study may be due to the module being a one-time annual training session, which contrasts structured, scaffolded training suggested by previous research.[22,25] Previous research has suggested having layered training that includes an educational module, direct observation of behavior and then debriefing of observed behaviors with specific critiques in order to create lasting change.[23,37] Based on this premise, we used videos to offer the learner the opportunity to observe and self-reflect. We posited that observation in a variety of scenarios may resonate with the participants and encourage self-recognition of behaviors exhibited in their practice, potentially prompting improved feedback behaviors. Based on our findings and those of previous research, it appears there is no substitution for observation with corrective feedback of precepting behaviors, complimented with facilitated debriefing.

Previous authors explored layered structure training for preceptors that yield desired behavior changes.[11,23] Behavior change must consist of three components: capability, opportunity and motivation.[40] In order to create change, the learner must be informed of the target behavior to be changed (delivering effective feedback), have the opportunity to contextualize it (assessments and self-perceived behaviors), and develop the motivation to create the change that is desired (follow up of possible changed behavior). Scaffolding includes layered education where a topic/skill is introduced and the student begins to take on a self-regulated learning while the educator prompts thought, reflection and action.[39] Over time, as more layers are introduced, the student begins to take on independence and autonomy.[39] Single-session training, as is common in athletic training preceptor training, and consistent with

the approach used in this study, failed to produce improved self-reported feedback behaviors. As such, athletic training educators should be considering the effectiveness of annual training and assessment, as defined by CAATE standard 33, and embrace a scaffolded instructional approach to teaching preceptors to be better clinical educators to better address CAATE standards 32 and 33.

Limitations

One limitation of this study is the use of self-reported behaviors on effective delivery of feedback without the contrast or comparison of direct observation or student-reported behaviors. This investigation attempted to recruit students to rate preceptor feedback behaviors; however, there were not enough matched pairs of student responses and preceptors who completed all aspects of this project. It is likely preceptors self-perceptions about feedback are higher than how students would have rated them. Future research should consider single or multi-institution studies triangulating preceptor feedback behaviors from the preceptor, student, and independent observer. Further, future research should analyze student reflection on feedback behavior at the time of preceptor feedback to better identify implementation and student response.

Another limitation is the fallout of participation between the three separate times from pre-, post-, and follow-up assessments. With a larger response across all three data collection times, better understanding of knowledge retention and behavior reporting could have been observed.

CONCLUSION

As a standalone module to increase immediate knowledge of effective feedback, the educational module created for this study was effective as the results indicate that the participants were broadly knowledgeable and improved to a level of 80% on the 25-item assessment. Disappointingly, however, preceptors were unable to define characteristics that constitute effective feedback, even after the on-line educational module. Behaviors regarding effective feedback were not changed over the long-term, which may have been a result of preceptors rating themselves as already effective or may reflect the ineffectiveness of standardized, one-time training on long-term knowledge retention. This module could be used to educate and refresh preceptors on effective feedback during annual training sessions as a tool to meet CAATE standard 33. If lasting change in behavior is desired, educators should consider the use of this module as a part of a continuous training plan that includes education in formal and/or live training, observation, and formative feedback.

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