original research

Feedback in Clinical Education, Part I: Characteristics of Feedback Provided by Approved Clinical Instructors

Sara Nottingham, EdD, ATC*; Jolene Henning, EdD, LAT, ATC†

*Chapman University, Orange, CA; †High Point University, NC

Context: Providing students with feedback is an important component of athletic training clinical education; however, little information is known about the feedback that Approved Clinical Instructors (ACIs; now known as preceptors) currently provide to athletic training students (ATSs).

Objective: To characterize the feedback provided by ACIs to ATSs during clinical education experiences.

Design: Qualitative study.

Setting: One National Collegiate Athletic Association Division I athletic training facility and 1 outpatient rehabilitation clinic that were clinical sites for 1 entry-level master's degree program accredited by the Commission on Accreditation of Athletic Training Education.

Patients or Other Participants: A total of 4 ACIs with various experience levels and 4 second-year ATSs.

Data Collection and Analysis: Extensive field observations were audio recorded, transcribed, and integrated with field notes for analysis. The constant comparative approach of open, axial, and selective coding was used to inductively analyze data and develop codes and categories. Member checking, triangulation, and peer debriefing were used to promote trustworthiness of the study.

Results: The ACIs gave 88 feedback statements in 45 hours and 10 minutes of observation. Characteristics of feedback categories included purpose, timing, specificity, content, form, and privacy.

Conclusions: Feedback that ACIs provided included several components that made each feedback exchange unique. The ACIs in our study provided feedback that is supported by the literature, suggesting that ACIs are using current recommendations for providing feedback. Feedback needs to be investigated across multiple athletic training education programs to gain more understanding of certain areas of feedback, including frequency, privacy, and form.

Key Words: assessment, evaluation, pedagogy, preceptors

Key Points

- Feedback had several different components that made each feedback exchange unique.
- The feedback that the Approved Clinical Instructors (ACIs) provided mostly was aligned with recommendations in the literature, suggesting our ACIs provided effective feedback to athletic training students and current recommendations are applicable to athletic training clinical education.
- Researchers should continue to assess the feedback that is occurring in different athletic training education programs to gain more understanding of the current use of feedback across several programs so they can guide ACI training and evaluation, including the development of recommendations for the appropriate frequency of feedback.

Feedback is any information provided to a student that helps correct, reinforce, or suggest change in his or her performance.[1,2] It is a type of evaluation that is less formal and judgmental than structured, summative evaluation and assessment[2] and is an effective educational technique.[3,4] Providing feedback to students also has been described as one of the most important characteristics of clinical instructors in athletic training,[5,6] medicine,[7,8] nursing,[9] and physical therapy.[10] In addition, feedback has been shown to improve clinical performance in medical[11,12] and nursing students.[13,14]

Most research on feedback has been focused on the recommended characteristics of feedback, such as its specificity, timing, tone, and relation to educational and career goals.[3,4,15] Much of the existing research is based on student and instructor perceptions of whether these recommendations are followed rather than actual observed feedback.[12,16] Feedback research in athletic training is much less extensive than other areas of clinical education. Most research on feedback in athletic training education has

been focused on general effective clinical instructor behaviors.[5,17,18] These investigators have identified feedback as an important behavior of Approved Clinical Instructors (ACIs),[5] and along with evaluation, it is considered a standard for selecting, training, and evaluating ACIs.[17,18] Several authors[1,19,20] have provided suggestions for giving effective feedback to athletic training students (ATSs) in clinical education. The supervision, questioning, feedback (SQF) model of clinical teaching provides guidelines for giving feedback to ATSs at different developmental levels.[1] Stemmans[21] compared the quantity of feedback provided by clinical instructors with different amounts of experience. The researcher found that novice clinical instructors provided less feedback to ATSs than more experienced clinical instructors did. Berry et al[22] reported that students in outpatient rehabilitation clinics spent more time engaged in active learning than did students in intercollegiate and high school settings. Because learning experiences differ among clinical settings, the feedback exchange also may differ among settings.
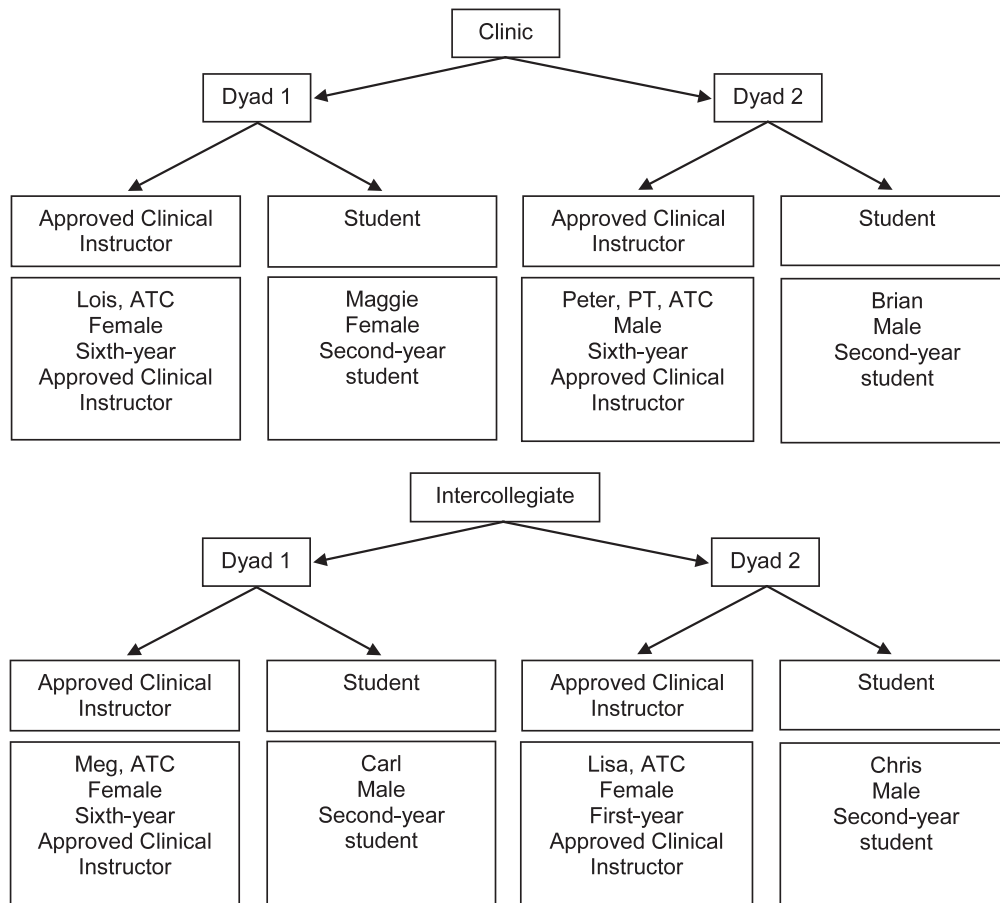
Figure. Participant dyads.

Providing feedback is considered to be one of the most important roles of ACIs during clinical education experiences.[5,6] However, feedback has been minimally explored in practitioner-based articles and research studies specific to athletic training. Little is known about the feedback ACIs provide to ATSs. Similarly, to our knowledge, no one has examined how feedback is used in different clinical education settings, such as rehabilitation clinics and collegiate athletic training facilities. Therefore, the purpose of our study was to characterize the feedback provided by ACIs to ATSs during clinical education sessions in 1 outpatient rehabilitation clinic and 1 collegiate athletic training facility.

METHODS

We used a qualitative design drawing from a case-study approach to investigate the interactions between ACIs and ATSs during clinical education experiences. We primarily followed a case-study design because it allowed us to collect detailed, in-depth information about 1 or more individual cases within a particular context.[23] Qualitative methods take into consideration the context and unique interactions of the participants[24] and typically include investigating participants within their natural settings.[25] The cases in this study included the ACI and ATS dyads in their different clinical education settings within 1 athletic training program (ATP). Observations, audio recordings, and field notes were documented to collect information about the feedback provided during clinical education experiences.

Setting

We conducted this study within 1 nationally accredited entry-level master's degree ATP at a large, public university in the Southeastern United States. We selected this ATP primarily due to convenience and secondarily to address the desire of educators to learn more about the characteristics and educational needs of entry-level master's degree ATSs as the educators contemplate transitioning from undergraduate to graduate-level education. The ATP had been accredited by the Commission for Accreditation of Athletic Training Education for 6 years and had 16 students enrolled at the time of data collection. This study was conducted at 2 affiliated clinical sites that the ATP used for clinical education experiences. One site was the university's collegiate athletic training facility, which is located within a National Collegiate Athletic Association Division I-AAA setting. Four full-time and 4 part-time assistant staff members worked in this facility and served about 275 patients participating in 6 in-season and 5 out-of-season intercollegiate athletic teams at the time of data collection. The other site was a private, community-based, outpatient rehabilitation clinic. Several athletic trainers, physical therapists, occupational therapists, and physical therapy assistants each treated approximately 10 patients per day in this clinic. The rehabilitation facility primarily

treated patients in the general population who had a range of injuries and conditions, including postoperative rehabilitation, chronic conditions, and general physical dysfunctions.

Participants

We used purposeful sampling to select participants. Eligible ATSs were in the second year of the ATP (ie, last year of the master's degree and third semester of clinical education) and were assigned to 1 of the data-collection sites in the fall 2010 semester. The ACIs who worked within the data-collection sites and had second-year ATSs assigned to them during this time were eligible to participate. The ACIs who participated in this study completed the standard ACI training of the ATP and had not received any focused, in-depth training in the provision of feedback to ATSs. Participant dyads and pseudonyms are displayed in the Figure. All participants provided written informed consent, and the University of North Carolina at Greensboro Institutional Review Board approved this study.

Data Collection

To observe the interactions between ACIs and ATSs and see and hear the actual feedback that was provided, we conducted observations of the ACI-ATS dyads. Direct observations allowed us to obtain a first-hand account of the topic under investigation.[25] We observed the setting, activities, and people in the environment to help understand the context of feedback.[25,26] During familiarization sessions, participant dyads were observed for two 1-hour sessions during the first week of data collection. This helped the participants become accustomed to our presence in the environment and allowed us to become familiar with the flow of the facility and patient interactions. The primary investigator (S.N.) conducted all observations and had limited direct interaction with participants.

After the 2 initial observation sessions, we conducted 3 additional observation sessions that also included audio recording of the participant dyads. During each of the 3 observation sessions, each participant was audio recorded throughout the day from 2 hours and 15 minutes to 5 hours. We conducted an additional day of observation for 1 ACI-ATS pair (Lisa and Chris) to reduce the discrepancy in total observation time between this pair and the other pairs. In the collegiate setting, we recorded only regular practice days (not treatment-only or game days) to maintain consistency between the number of hours and activities completed. During each audio-recording data-collection session, we continuously observed and took field notes. We recorded each participant with a lapel microphone (Pro 88W; Audio-Technica US, Inc, Stow, OH) that wirelessly transmitted to a receiver attached to the researcher. The receiver fed into an audio recorder (Zoom H2; Samson Technologies, Hauppauge, NY), and the researcher wore an earpiece that allowed her to hear the conversation from a distance. Throughout the study, we found that maintaining a distance of 15 to 20 ft (4.5 to 6 m) from the participants was most effective because it allowed us to maintain clear visual observation and an auditory pathway while minimally influencing the participants.

Throughout observation periods, we took notes about the physical setting, participants, activities and interactions, subtle behavior, and our behavior.[25] Notes also included our thoughts, feelings, and reactions to what we observed. We focused on describing the nonspoken feedback in detail because this was not captured on the audiotapes. (Participants used the terms "verbal" and "nonverbal," but they meant "spoken" and "nonspoken." We use "spoken" and "nonspoken" in this article.) This feedback included behavior, such as a head nod, "thumbs up," correction of hand placement, or demonstration of a rehabilitation exercise. We recorded the location of participants on a map of the room when their locations changed. We also noted our behavior, such as distance from the participants, how much interaction with the participants occurred, and the perceived influence of our presence in the environment. The time of each note was written so the information could be linked to the audio files during data analysis.[26] In addition to recording field notes during observation periods, we took time after each observation period to note any thoughts, feelings, or reactions.[25]

Data collection occurred over 7 weeks. The purpose of this period was to capture a descriptive snapshot of the ACI-ATS interactions over several weeks. Given that human behavior is rarely static, the relationship between the ACI and ATS may have continued to evolve after the study concluded.[25]

Data Analysis

All data were coded according to participant number, site, and pseudonym. The primary investigator listened to the audio files and transcribed only the feedback statements. All transcriptions were completed within 72 hours of the actual data collection. After collecting all data, we conducted inductive analysis of the remaining data. This allowed information and categories to emerge from the data without imposing predetermined categories on it.[26] We used the grounded theory or constant comparative approach[27] that included the process of open, axial, and selective coding of data to develop categories.[28] Open coding included breaking down, examining, and initial categorizing of data. Axial coding was conducted after initial categories were developed, and the data were reexamined with these new codes in mind. Lastly, selective coding included refining and supporting the established categories.

Individual pieces of data were coded separately first and then were combined with other data sources for analysis. After this initial coding, data were brought together during the analysis process to develop categories. Field notes were tied into observations to add context, researcher reflections, and details to the information. Data were analyzed within cases and then compared among cases to develop findings.[25] This coding process continued until coding was saturated and distinct categories were developed.

Trustworthiness

Issues of trustworthiness were addressed with several methods, including triangulation, peer debriefing, member checking, and rich description. Several methods of triangulation were used to improve credibility of the study and included multiple methods of data collection and

Table 1. Length of Observations and Number of Feedback Exchanges

Audio	Observations and Feedback	Meg and Carl	Lisa and Chris	Lois and Maggie	Peter and Brian	Total
1	Length of observation, h:min	2:40	3:40	5:00	4:00	15:20
	Feedback exchanges, n	2	9	16	3	30
2	Length of observation, h:min	4:00	2:20	4:45	4:00	15:05
	Feedback exchanges, n	4	2	15	8	29
3	Length of observation, h:min	3:40	2:40	2:15	3:30	12:05
	Feedback exchanges, n	1	9	4	12	26
4	Length of observation, h:min	Not applicable	2:40	Not applicable	Not applicable	2:40
	Feedback exchanges, n	Not applicable	3	Not applicable	Not applicable	3
	Total time	10:20	11:20	12:00	11:30	45:10
	Total feedback	7	23	35	23	88

collecting data at different sites. Throughout the study, 2 peer debriefers tested developing categories and verified the primary investigator's findings.[29] One peer debriefer was an experienced athletic training educator and director of the program being investigated, and the other peer debriefer had 6 years of experience conducting qualitative research. These peers evaluated the researcher's process of coding and development of the findings throughout the research process to ensure the data were presented accurately and challenged any assumptions that were brought to the research.[25,30]

Member checking includes testing the data, categories, and interpretations of the study with the participants and improves credibility of a study.[29] Eight weeks after data collection ceased, we contacted participants by e-mail for follow-up clarification of the initial categories that emerged from the observations. Participants could discuss the findings with us by telephone, by e-mail, or in person. No participants disagreed with the findings. Rich description of the data-collection and analysis process, in addition to the use of an audit trail, improves transferability of this study. Readers may use this information to determine the applicability of the findings to their situations.

Table 2. Frequency of Feedback Categories[a]

Category	Number
Purpose	
Confirm/reinforce	61
Correct	27
Promote improvement	51
Timing	
Immediate	74
Other	14
Specificity	
General	32
Specific	56
Content	
Skills	58
Reasoning	14
Other	16
Form	
Spoken	81
Nonspoken	7
Privacy	
Public	54
Private	34

[a] Indicates a total of 88 feedback statements.

RESULTS

A total of 88 feedback exchanges occurred between ACIs and ATSs during 45 hours and 10 minutes of observation. The length of each observation session and the amount of feedback provided during each observation period is shown in Table 1. The frequency of each category of feedback is displayed in Table 2. Six categories emerged from the data related to this research question: purpose, timing, specificity, content of feedback, form of feedback, and privacy. Selective verbatim statements are included to support the 6 categories.

Purpose of Feedback

We found that feedback was given to ATSs for several reasons during the observed clinical education experiences. These reasons included confirming or reinforcing their behaviors, correcting behaviors, and promoting improvement in future performances.

Confirm or Reinforce Behavior. Most feedback given during these clinical education experiences confirmed or reinforced behavior. Some statements, such as Peter's response to his ATS Brian were made to confirm something the ATS was saying about his or her clinical reasoning. In the following statement, Peter was quizzing Brian about the order in which he would treat a patient's muscles:

Brian: So basically my thing [process] was working posterior to anterior for the ease of the patient, from the chair to supine.

Peter: Okay, I like that. That's good. I think that's a pretty good plan.

(C2 Audio 2, 3:36 PM)

At other times, the ACI provided reinforcing feedback as the ATS was doing or saying something, such as explaining the plan for a patient's rehabilitation session or providing reasoning behind an ultrasound treatment. Lois, in particular, often provided reinforcing feedback to her ATS Maggie as she explained her plan for leading her patients through rehabilitation with statements, such as "yep" and "sounds good" (C1 Audio 1, 10:06 AM).

Correct Behavior. Feedback also was provided to correct the behavior of an ATS either during or after a performance. In the following example, Lois instructed Maggie to change the patient's position while leading a hamstring stretch. Maggie recognized her incorrect behavior and changed it immediately.

Lois: Let's put that leg off the table.

Maggie: Oh, I always forget that.

(C1 Audio 1, 7:21 AM)

The ACIs provided corrective feedback in different ways. Corrective feedback often was accomplished in a less direct way than reinforcing feedback. Often, ACIs waited to give corrective feedback until the ATS was no longer treating a patient, which Lisa frequently did when giving corrective feedback to Chris. For example, Lisa waited to give Chris feedback on his communication with a patient until after the patient left the athletic training room (A2 Audio 1, 12:49 PM).

Promote Improvement in Future Performance. The ACIs often gave feedback to suggest change or improvement even when an ATS was not doing anything incorrectly. Feedback to promote improvement in future performance occurred with reinforcing or corrective feedback more than half the time. These feedback statements frequently included detailed explanations by the ACI or long discussions between the ACI and ATS. For example, Meg gave Carl several tips for leading a dynamic warm-up after he guided the soccer team through a warm-up for the first time. During their discussion, Meg included several tips, such as "position yourself so you are always in front of them" and "make sure you're giving all of that cueing because it's a great opportunity to teach [the patient]" (A1 Audio 1, 10:11 AM). Several ACIs provided feedback and additional information to ATSs to help them in the future, suggesting that feedback can be given even when the ATSs are not doing something incorrectly.

Timing

Most of the feedback that these ACIs provided was given during or immediately after an ATS performed a skill. Immediate feedback typically was given for performing skills so the ATS immediately could change how he or she was treating a patient. For example, Meg suggested that Carl change his manual resistance while he was still treating the patient:

Meg: So, like if you have to adjust your resistance, like if she gets to the end, then do so, but if it allows her to work through greater [range of motion] . . .

Carl: [changes his position as Meg talks to him]

Meg: There you go. You see what I'm saying?

(A1 Audio 1, 10:20 AM)

In contrast, feedback on professional behaviors often was delayed. For example, Chris arrived to his clinical rotation wearing another school's attire and sandals and began talking to a patient before Lisa noticed his clothing. She waited a few minutes until the patient walked out of the room before speaking to him about his inappropriate attire (A2 Audio 4, 7:32 PM).

Specificity

Feedback was given with different degrees of specificity. Sometimes, feedback was very general, such as "good job," where the statement could have been applied to any situation. Feedback was also more specific, with the ACI providing details about what the ATS did and why. Even more detailed feedback was given when the ACI gave a reason for providing the feedback or evidence to support the statement.

General. General feedback included feedback that lacked detail or could be applied to any situation. Whereas not

given as frequently as specific or supported feedback, nondescriptive feedback was given at least once by each ACI. For example, Lisa gave general feedback to Chris at the end of one day:

Lisa: Good job today. We are done.

Chris: Thank you.

(A2 Audio 2, 2:33 PM)

This feedback statement made by Lisa appeared to summarize Chris' performance for the day rather than a specific task or activity he did.

Specific. All 4 ACIs frequently gave specific feedback that included detail about the ATS's performance. Often, ACIs provided details about why they gave the feedback they did, sometimes even citing a source that supported their comments. During the following feedback exchange, Carl seemed to question or be unsure about what Meg, his ACI, was telling him, so she countered with a statement that clarified why she wanted the athlete's back to be flat:

Carl: [explaining/correcting athlete's technique on exercise] Pull your shoulders up. There you go.

Meg: Nope. That way [points/touches athlete's shoulders to demonstrate].

Carl: Flat back?

Meg: Yeah, that way her serratus is turned on.

(A1 Audio 2, 8:30 PM)

The ACIs often provided feedback with evidence to explain why the ATS should change their behaviors. In this example, Meg provided specific feedback by demonstrating how she wanted Carl to change his instructions to the patient and supporting her statement with the explanation of serratus anterior muscle activation.

Content

The ACIs provided feedback to ATSs that was based on their clinical skills and clinical reasoning, with most focus placed on clinical skills. The clinical skills included activities, such as evaluating or treating a patient; leading the patient through a rehabilitation exercise and putting together a rehabilitation program; and writing a subjective, objective, assessment, plan (SOAP) note. Clinical reasoning included conversation that focused on the thought process or decision making of the ATS. Feedback also was given on the professional behaviors of ATSs, such as communication and overall professionalism, but this did not occur enough to stand as its own category.

Clinical Skills. Most feedback the ACIs provided was on performance of clinical skills, such as progressing a rehabilitation session, performing a joint mobilization, or leading a patient in an exercise or stretch. In 1 situation, Brian was leading a patient through a quadruped exercise when his ACI Peter corrected him:

Peter: So take him . . . work him in a short arc.

Brian: [alters patient movement]

Peter: That's it.

(C2 Audio 3, 8:38 AM)

Peter's feedback allowed Brian to immediately change how he was leading the patient, and Peter confirmed his correction. Feedback on the clinical skills of an ATS occurred immediately as he or she was performing the skill, as shown, in addition to after the skill was completed.

Clinical Reasoning. Feedback also was provided on the ability of ATSs to critically think or describe their rationale

for clinical decisions. All ACIs, except Meg, provided some feedback on the clinical reasoning of their ATSs. For example, Brian described to the patient why the patient felt like 1 foot was different from the other, and Peter commented on his explanation:

Brian: I don't know about you [looks to Peter], but I'd imagine after surgery you're going to have some scar tissue development, and I'd imagine that that's probably why this one might feel thicker. It's because there's actually more scarring going on because you've had multiple surgeries.

Peter: Ahhh, that's exactly. I couldn't have said it any better myself. That's it. That's exactly right [continues to talk to patient with more detail].

(C2 Audio 3, 5:06 PM)

In this situation, the patient asked Peter a question, and Peter looked to Brian, his ATS, to answer it. Peter's feedback confirmed that Brian's thought process and explanation to the patient were correct, and Peter continued to elaborate on Brian's explanation after the feedback exchange ended. When feedback was given on the clinical reasoning of ATSs, it often occurred during a discussion that included the ACI questioning the reasoning of the ATS, the ATS responding with his or her explanation, and the ACI providing feedback.

Form

The ACIs delivered feedback in multiple forms, including spoken and nonspoken. Most of the feedback the ACIs provided was nonspoken in conjunction with spoken feedback. Nonspoken feedback included a simple nod of the head, a demonstration, or physically leading the ATS through a movement. For example, Brian was leading a patient in a balance exercise while Peter stood about 10 ft (3 m) away and watched. Instead of making a spoken comment, Peter made eye contact with Brian and tapped his chin, indicating the patient's head needed to be up. Brian then changed the patient's position (C2 Audio 2, 2:04 PM). In this situation, Peter provided corrective feedback without the patient knowing.

In another situation, Lois guided Maggie's shoulder mobilizations by moving her hands through the air to correct Maggie's movement. Combined with her spoken feedback, this allowed Lois to alter Maggie's behavior without touching the patient.

Lois: So I would lift her up more into flexion. Right to there, and then . . .

Maggie: So it's more going to be scapular?

Lois: Yeah.

(C2 Audio 2, 8:32 AM)

The ACIs often appeared to give nonspoken feedback in this way to help lead the ATS without taking over. At other times, the ACI actually would place his or her hands on a patient along with the ATS's hands to help guide the ATS. The ACIs appeared to use this type of hands-on spoken feedback as a way to be more specific but still allow the ATS to treat the patient.

Privacy

Public. Feedback was considered to be in public when someone else was within earshot, including a patient, other ATS, or clinician. When providing corrective feedback in public, ACIs sometimes used less direct approaches, such as prompting change with a question. In the following example, Lisa does this while the patient being treated is lying on a nearby table:

Chris: So I'm thinking a heat pack and some ultrasound and stretching?

Lisa: How about just a heat pack and stretching?

Chris: Okay.

(A2 Audio 3, 7:17 PM)

By phrasing her feedback as a question, she could suggest to Chris what she really wanted him to do rather than saying he was incorrect. Most feedback that occurred in public was given in front of the patient being treated.

Private. Feedback also was provided in a more private setting, including not only a private office, but also the main clinic or athletic training room when no one else was within earshot. Lois and Maggie often discussed patient rehabilitation progressions and notes in the main clinic area between patients when no one else was present. Lois quizzed Maggie, her ATS, about their next patient:

Lois: How are you going to challenge him today?

Maggie: I was thinking with the single-leg balance, we should scale them back a little bit with the rotation.

Lois: Yeah.

Maggie: We talked about not going all the way back to the wall just because he is not as controlled with that.

Lois: Yeah, I think that's a good idea.

(C1 Audio 2, 6:00 AM)

Lisa often gave Chris feedback in the back office area of the athletic training room after the wrestlers had gone to practice. The feedback she gave in private was often a part of long conversations about Chris' professional behaviors and ability to balance his responsibilities. Lisa appeared to deliberately wait to have these conversations until no one else was present.

DISCUSSION

Most of the feedback the ACIs provided in our study was aligned with recommendations in the literature. The ACIs provided feedback that corrected and confirmed the behavior of ATSs, which helps them challenge and validate developing knowledge.[31,32] The SQF model of clinical teaching suggests that novice ATSs need more corrective feedback, whereas advanced or autonomous learners need more directive feedback.[1] The ACIs in our study provided more reinforcing feedback than corrective feedback to these advanced ATSs. Much of their feedback also was given to promote improvement in future performance, which is similar to the SQF model's description of directive feedback.[1] These findings are aligned with recommendations in the SQF model, suggesting this model is applicable to entry-level master's degree ATSs, and these ACIs followed guidelines for providing effective feedback to their ATSs. In addition to providing feedback to confirm and correct behavior, ACIs frequently provided feedback on communication skills, professional behaviors, clinical reasoning, and clinical skills, which experts in clinical education also recommend.[2,33,34] These findings suggest that the ACIs in our study provided feedback to help ATSs improve in several areas of their clinical practices with challenging and supportive feedback.

The ACIs participating in our study primarily gave feedback to ATSs while they were performing skills or

immediately after. These findings coincide with recommendations in education[4] and athletic training,[34] stating that immediate feedback is more effective for student learning. Researchers[4,35] in education also have concluded that feedback is more effective when it provides details on how to improve rather than just corrects the behavior. Feedback that is specific provides more information to help students improve, which promotes student learning.[3,36] The ACIs in our study provided more specific than general feedback, suggesting that these participants are following recommendations for the effective delivery of feedback.

Regarding the frequency of feedback, few research studies have been conducted and few recommendations have been made about the frequency of feedback that should be provided to students in the clinical setting. Pringle[37] evaluated the effect of different frequencies of feedback on chiropractic students performing a spinal manipulation and found that infrequent and constant feedback both were detrimental to student learning. The author[37] concluded that providing feedback one-third of the time produced the best long-term learning in students. No other researchers have examined the ideal frequency of feedback in clinical education, leaving clinical instructors to use their own judgment when deciding how often they should provide feedback to students.

The ACIs in our study provided 88 feedback statements in 45 hours of ATSs' clinical experiences, averaging about 2 feedback statements per hour for all ACIs. In contrast, Stemmans[21] found that novice ($\leq$1 year of experience), intermediate (2–4 years of experience), and experienced ($\geq$5 years of experience) clinical instructors provided 0.8, 5.5, and 5.8 feedback statements, respectively, per 10 minutes of observation. In addition, the author[21] found that novice clinical instructors provided less feedback than intermediate and experienced clinical instructors. These results do not coincide with those of our study because Meg had the same amount of clinical teaching experience as Lois and Peter, who provided 7, 35, and 23 feedback statements, respectively, during the observed periods. Lisa, the only novice ACI, provided just as much feedback as Peter, an experienced clinician and ACI.

The clinical education setting also may have influenced the frequency of feedback exchanges that occurred between ACIs and ATSs in our study. Each ATS had different learning opportunities and experiences during the clinical rotation. Whereas actual active learning time was not recorded, Brian and Maggie noticeably spent more time actively treating patients than Chris and Carl. Carl had even less active learning time than Chris due to the lower patient volume. These observations are similar to those of Berry et al,[22] who found ATSs in the rehabilitation clinic spent more time actively learning than ATSs in the collegiate setting.[22] These differences are likely due to the nature of the setting, where time in the rehabilitation clinic is spent with regularly scheduled patients, and time in the collegiate setting often is spent observing practices and games. With less active learning time, it is likely that less feedback is also provided. Carl did the least amount of active patient care during his clinical experiences, and Meg provided the least amount of feedback. For example, on their last observation day, Carl interacted with only 1 athlete in almost 4 hours because only 1 athlete needed assistance, but when he interacted with this athlete, Meg gave him

feedback. That was the only feedback she gave that day. Whereas other factors may have caused this lack of feedback, the presence of learning opportunities should be considered a potential influence on the provision of feedback.

These frequent comparisons do not account for the overall quality of feedback, which is more important than the mere amount of feedback provided. Unfortunately, the study by Stemmans,[21] which is the only comparative research in athletic training, to our knowledge, is currently only represented in a peer-reviewed abstract; therefore, sufficient detail is not available to explain the discrepancy in the observed frequency of feedback between these studies. Possible explanations include differences in patient volume, clinical settings, level or maturity of ATSs, or training of ACIs. More information is needed in this area before educators can make specific recommendations on the ideal frequency of feedback in this environment, and further research should be conducted across multiple programs to more extensively investigate this area.

The ACIs also were observed giving ATSs both spoken and nonspoken feedback. To our knowledge, no researchers have compared spoken and nonspoken feedback given during clinical education experiences. Considering ACIs usually gave feedback immediately and in speech, they likely chose to provide spoken feedback because it was most convenient and easy to give immediately. The ACIs appeared to give nonspoken feedback as an aid to spoken feedback rather than by itself. Their spoken feedback usually helped clarify what they were saying about a practical skill in addition to making corrective feedback less noticeable to the patient. Whereas our participants were required to complete written feedback every 2 weeks as part of their regular responsibilities as ACIs, we never observed this written feedback exchange or any other informal written feedback exchanges. We do not suggest that ACIs were not following the guidelines of the ATP but rather indicate the use of spoken feedback appears to be selected due to convenience and ease of communicating their thoughts.

Another area of feedback that has not been investigated, to our knowledge, is whether feedback is provided in a public or private setting. The ACIs in our study provided feedback in both public and private settings. The decision to give feedback in public or private appeared to depend on the availability of the ACI to provide feedback and the potential of the ATS to harm the patient. Peter spent almost all of his time communicating with Brian while they were in front of a patient because he did not appear to have time to provide feedback in private. Other ACIs, especially Lois, gave much of her feedback in private because she appeared to have more time to discuss Maggie's performance with her. The ACIs also appeared to give feedback in public when they were concerned that the ATS would harm the patient or was not meeting the goals for the patient. This occurred a few times with the ACI interrupting the ATS to change what he or she was doing before the patient was harmed. In some cases, ACIs waited to give feedback on professional behaviors or more sensitive topics in private. For example, when Lois wanted to give feedback to Maggie about her communication with the patient, she waited until the patient was gone so she did not embarrass Maggie. The ACIs rarely gave feedback in front of another ATS or

clinician, probably because few opportunities existed to do so. No researchers, as far as we know, have investigated the delivery of feedback in public or private clinical education settings. However, several researchers[20,38] have recommended that clinical instructors should try to maintain the trust of and avoid embarrassing the ATS when providing feedback. The ACIs in our study appeared to attempt to do this by giving more sensitive feedback in private. The choice of whether to give feedback in public or private seems to be a balance among protecting the patient, providing timely feedback, and avoiding embarrassing the ATS.

IMPLICATIONS

Our findings illustrate that feedback has several different components that make each feedback exchange unique. Because each feedback exchange may include a different combination of the components of feedback, such as privacy, form, and timing, standardizing the feedback process for training and evaluation purposes is difficult. Whereas feedback exchanges can vary greatly, ACIs should apply several recommended characteristics of feedback. It should be given immediately as the ATS is completing a task or as soon after as possible. Feedback should include enough detail to help the ATS understand it and improve his or her performance from it. Typically, more specific feedback is helpful to ATSs. It should be given in various forms, especially a combination of spoken and nonspoken. The ACIs should provide feedback to help ATSs recognize when they are doing something right or wrong. If an ATS is doing something incorrectly, feedback should help guide him or her toward correct behavior. The ACIs also should consider providing feedback that helps improve their performance and promote learning even if they were not incorrect. Feedback should be provided on the critical thinking and professionalism of ATSs in addition to their clinical skills.

The ACIs in our study provided feedback that mostly was aligned with recommendations in the literature,[1,2,33,34] suggesting our ACIs provided effective feedback to ATSs and current recommendations are applicable to athletic training clinical education. Athletic training educators should continue to use these recommendations for effective feedback when training and evaluating ACIs. Educators should focus ACI training on helping them provide effective feedback even in busy clinical environments where giving quality feedback may be challenging.[39] Including discussions, scenarios, and problem solving in ACI training can help ACIs and educators brainstorm how to adapt feedback to these environments.

Limitations

Our study was limited to 1 entry-level master's degree ATP in the Southeastern United States. Because of the small number of participants and type of program, our results may not be transferrable to undergraduate ATPs or other types of institutions. Only rehabilitation clinic and collegiate clinical education settings were studied; similar results may not be found in other clinical education settings. In addition, we examined only 1:1 ACI-ATS ratios. All participants were white, so findings may not be applicable to more diverse ACI-ATS dyads. In addition,

the experiences of these ATSs may not be typical of undergraduate ATSs because differences may exist in maturity between undergraduate and graduate ATSs. The 7-week data-collection period was also a limitation because we were unlikely to capture changes that occurred in clinical teaching and feedback over longer periods of time. In addition, observations were conducted during weeks 3 to 7 of a 15-week semester. The ACI-ATS interactions may have changed throughout the semester as ATSs and ACIs became more comfortable with each other. Researchers should explore how these components of student learning experiences transform throughout their educations.

Recommendations for Future Research

Researchers should continue to assess the feedback that is occurring in different ATPs. Gaining more understanding of the current use of feedback across several ATPs can help guide ACI training and evaluation, including the development of recommendations for the appropriate frequency of feedback. In addition, we only examined ACI-ATS interactions that were 1-on-1. Considering that 1 ACI may supervise more ATSs, researchers also should examine how feedback exchanges may differ when an ACI is supervising multiple ATSs. The role of peer feedback should be considered when examining ACI-ATS interactions that include multiple ATSs. Lastly, researchers should examine the feedback exchanges between ACIs and ATSs in undergraduate ATPs.

REFERENCES

1. Barnum MG, Guyer S, Levy LS, Graham C. The supervision, questioning, feedback model of clinical teaching: a practical approach. In: Weidner TG, ed. *The Athletic Trainer's Pocket Guide to Clinical Teaching*. Thorofare, NJ: Slack Incorporated; 2009:85–99.
2. Ende J. Feedback in clinical medical education. *JAMA*. 1983;250(6):777–781.
3. Hattie J, Timperley H. The power of feedback. *Rev Educ Res*. 2007;77(1):81–112.
4. Shute VJ. Focus on formative feedback. *Rev Educ Res*. 2008;78(1):153–189.
5. Lauber CA, Toth PE, Leary PA, Martin RD, Killian CB. Program directors' and clinical instructors' perceptions of important clinical-instructor behavior categories in the delivery of athletic training clinical instruction. *J Athl Train*. 2003;38(4):336–341.
6. Curtis N, Helion JG, Domsohn M. Student athletic trainer perceptions of clinical supervisor behaviors: a critical incident study. *J Athl Train*. 1998;33(3):249–253.
7. Sutkin G, Wagner E, Harris I, Schiffer R. What makes a good clinical teacher in medicine? A review of the literature. *Acad Med*. 2008;83(5):452–466.
8. Torre DM, Simpson D, Sebastian JL, Elnicki DM. Learning/feedback activities and high-quality teaching: perceptions of third-year medical students during an inpatient rotation. *Acad Med*. 2005;80(10):950–954.
9. Kelly C. Students' perceptions of effective clinical teaching revisited. *Nurse Educ Today*. 2007;27(8):885–892.
10. Jarski RW, Kulig K, Olson RE. Clinical teaching in physical therapy: student and teacher perceptions. *Phys Ther*. 1990;70(3):173–178.
11. Wigton RS, Patil KD, Hoellrich VL. The effect of feedback in learning clinical diagnosis. *J Med Educ*. 1986;61(10):816–822.

12. Boehler ML, Rogers DA, Schwind CJ, et al. An investigation of medical student reactions to feedback: a randomised controlled trial. *Med Educ*. 2006;40(8):746–749.

13. Milde FK. The function of feedback in psychomotor-skill learning. *West J Nurs Res*. 1988;10(4):425–434.

14. Glover PA. Feedback: I listened, reflected and utilized. Third year nursing students' perceptions and use of feedback in the clinical setting. *Int J Nurs Pract*. 2000;6(5):247–252.

15. Elnicki MD, Layne RD, Ogden PE, Morris DK. Oral versus written feedback in medical clinic. *J Gen Intern Med*. 1998;13(3):155–158.

16. Gil DH, Heins M, Jones PB. Perceptions of medical school faculty members and students on clinical clerkship feedback. *J Med Educ*. 1984;59(11 pt 1):856–864.

17. Weidner TG, Henning JM. Development of standards and criteria for the selection, training, and evaluation of athletic training approved clinical instructors. *J Athl Train*. 2004;39(4):335–343.

18. Weidner TG, Henning JM. Importance and applicability of approved clinical instructor standards and criteria to certified athletic trainers in different clinical education settings. *J Athl Train*. 2005;40(4):326–332.

19. Barnum MG, Guyer MS, Levy LS, et al. Questioning and feedback in athletic training clinical education. *Athl Train Educ J*. 2009;4(1):23–27.

20. Swann E. Communicating effectively as a clinical instructor. *Athl Ther Today*. 2002;7(5):28–33.

21. Stemmans CL. Novice clinical provide less feedback to athletic training students than their more experienced clinical instructors [abstract]. *J Athl Train*. 2009;44(3 suppl):S59–S60.

22. Berry DC, Miller MG, Berry LM. Effects of clinical field-experience setting on athletic training students' perceived percentage of time spent on active learning. *J Athl Train*. 2004;39(2):176–184.

23. Mason J. *Qualitative Researching*. 2nd ed. Thousand Oaks, CA: Sage; 2002.

24. Merriam SB. *Qualitative Research: A Guide to Design and Implementation*. San Francisco, CA: Jossey Bass; 2009.

25. Creswell JW. *Qualitative Inquiry and Research Design: Choosing Among Five Traditions*. Thousand Oaks, CA: Sage; 1998.

26. Patton MQ. *Qualitative Evaluation and Research Methods*. 2nd ed. Newbury Park, CA: Sage; 1990.

27. Glaser B, Strauss A. *The Discovery of Grounded Theory: Strategies for Qualitative Research*. New York, NY: Aldine de Gruyter; 1967.

28. Strauss A, Corbin J. *Basics of Qualitative Research*. Newbury Park, CA: Sage; 1990.

29. Lincoln YS, Guba EG. *Naturalistic Inquiry*. Beverly Hills, CA: Sage; 1985.

30. Shenton AK. Strategies for ensuring trustworthiness in qualitative research projects. *Educ Inform*. 2004;22(2):63–74.

31. Merriam SB, Caffarella RS, Baumgartner LM. *Learning In Adulthood: A Comprehensive Guide*. 3rd ed. San Francisco, CA: Jossey-Bass; 2006.

32. Kolb DA. *Experiential Learning: Experience as the Source of Learning and Development*. Englewood Cliffs, NJ: Prentice Hall; 1984.

33. Molloy E. Time to pause: giving and receiving feedback in clinical education. In: Delany C, Molloy E, eds. *Clinical Education in the Health Professions*. Chatswood, New South Wales, Australia: Churchill Livingstone Australia; 2009:128–146.

34. Weidner TG, Henning JM. Being an effective athletic training clinical instructor. *Athl Ther Today*. 2002;7(5):6–11.

35. Bangert-Drowns RL, Kulik CLC, Kulik JA, Morgan MT. The instructional effect of feedback in test-like events. *Rev Educ Res*. 1991;61(2):213–238.

36. Cantillon P, Sargeant J. Giving feedback in clinical settings. *BMJ*. 2008;337:a1961.

37. Pringle RK. Guidance hypothesis with verbal feedback in learning a palpation skill. *J Manipulative Physiol Ther*. 2004;27(1):36–42.

38. Bing-You RG, Paterson J, Levine MA. Feedback falling on deaf ears: residents' receptivity to feedback tempered by sender credibility. *Med Teach*. 1997;19(1):40–45.

39. Henning JM, Weidner TG. Role strain in collegiate athletic training approved clinical instructors. *J Athl Train*. 2008;43(3):275–283.

Address correspondence to Sara Nottingham, EdD, ATC, Chapman University, College of Educational Studies, 1 University Drive, Reeves 208, Orange, CA 92866. Address e-mail to nottingh@chapman.edu.