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ORIGINAL RESEARCH

Preceptor Education on the Use of Clinical Teaching Models in Clinical Education

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Context: Preceptor training is designed to provide instruction on preceptorship, an overview of athletic training program processes, and preceptor professional development. Preceptors generally do not have formal training on how to be educators. Most preceptor training occurs at the institutional level, with content, frequency, and delivery at the discretion of the institution.

Objective: Investigate preceptors' perceptions of how preceptor training prepares them for using clinical teaching models and how preceptor training can be improved.

Design: Concurrent mixed methods.

Setting: Web-based survey and virtual semistructured interviews.

Patients or Other Participants: One hundred sixty-five preceptors (average of 10 ± 9 years of preceptorship experience) completed the survey. Ten participants (4 male, 6 female) participated in interviews (average of 12 ± 10 years of preceptor experience).

Data Collection and Analysis: Surveys were dispersed via Qualtrics, and virtual interviews were recorded using Zoom. The χ^2 test for independence determined if any relationships existed between years of experience, type of preceptor training, and clinical teaching models used. A phenomenological approach of inquiry was used to analyze the interview data. Trustworthiness was established with member checking, triangulation using 2 data collection methods and independent data analysts, and external peer review.

Results: Participants reported preceptor training focuses on programmatic administration rather than clinical teaching. In our study, 68% of preceptors had completed institutional preceptor training related to clinical teaching, and 24% had completed the Master Preceptor level 1 training program. Preceptors desire training that incorporates active engagement regularly to educate them on clinical teaching models.

Conclusions: The content and frequency of institutional preceptor training should be reassessed, as it provides foundational knowledge to preceptors on clinical teaching. Most preceptors have little formal preparation in clinical teaching and believe preceptor training does not adequately prepare them to educate students using the best clinical teaching practices for the profession.

Key Words: Clinical instructor, clinical education, professional socialization

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KEY POINTS

- Preceptors feel untrained on topics of clinical teaching or the use of clinical teaching models.
- Preceptors express the desire to improve their clinical teaching knowledge and skills.
- Institutional preceptor training lacks focus on clinical teaching and emphasizes programmatic administrative policy and procedures.
- Preceptors desire more frequent, consistent professional development in clinical teaching that itself uses active learning techniques within the framework of training.

INTRODUCTION

Preceptors are health care providers who integrate educating health care students into their daily clinical practice.[1] These educators bridge the gap between didactic knowledge and clinical practice. Preceptors aid students in developing the soft and technical skills needed to become credentialed health care providers. Exposing students to the diverse skill set of athletic trainers (ATs) requires an immense amount of time in clinical education, reportedly over half of the total program time.[2–4] Athletic training students report preceptors are the most influential aspect of their professional preparation as they progress through their academic journey.[5]

Preceptors are nationally credentialed in their clinical practice yet clinically educate and supervise students while having little to no andragogy background.[6] Preceptor training creates the means for onboarding new preceptors and providing continuous development opportunities. The Commission on Accreditation of Athletic Training Education (CAATE) states within Standard 45 of the 2020 Standards for Professional Programs that preceptors should have "planned and ongoing education for their role as preceptor."[7(p42)] Additionally, Standard 48 requires programs to regularly "conduct evaluations and provide feedback to preceptors on their quality of clinical instruction and student learning."[7(p43)] Nothing in the CAATE standards dictates specifically how or when preceptors are to be educated on their roles in education. Therefore, institutions are given autonomy in the frequency, delivery, and content of preceptor training so long as the program establishes a plan for preceptor training. Similarly, the nursing profession orients its preceptors at the institutional level with orientation programs.[8] However, in respiratory therapy and pharmacy, national preceptor training programs have been implemented to help promote better preceptor education.[9,10]

In 2017, the National Athletic Trainers' Association (NATA) launched, at a cost to the consumer or institution, a self-guided program called the Master Preceptor program to provide a national platform to train preceptors on clinical education and preceptorship.[11] This web-based professional development program is designed currently with 2 certificate levels that focus on aspects of preceptorship, including fundamentals of clinical education and teaching strategies focusing on clinical reasoning, ethics, and cultural competency.[11]

Given the lack of formal preparation of preceptors in educational techniques, athletic training programs need to socialize preceptors into their roles appropriately. Formal methods of socialization include preceptor training workshops, professional development conferences or webinars, and related specialty certifications in teaching.[12,13] Informally, preceptors may use observation, conversations, prior personal experiences, or self-reflection to help enhance their preceptorship skills over time as they gain further experience.[12,13] Preceptors have previously reported acquiring their knowledge of clinical teaching practices through self-reflection or peer mentoring, not from more formal methods such as preceptor training.[6]

To help preceptors enhance their clinical teaching, preceptor training could incorporate different clinical teaching models, such as the One-Minute Preceptor (OMP) model, the Supervision, Questioning, Feedback (SQF) model, or the SNAPPS model. The OMP is a 5-component model: (1) get a commitment, (2) probe for supporting evidence, (3) reinforce what was done correctly, (4) correct mistakes, and (5) teach a general rule.[14] The OMP model is commonly used in medicine and nursing[14,15] focusing on clinical reasoning, self-reflection, and supporting clinical decisions with evidence. The SQF model is reported in athletic training[16,17] and speech-language pathology[18–20] as an integrated model of supervised autonomy, progressive difficulty of questioning, and providing structured positive and constructive feedback. The SNAPPS model is a student-centered model used in medicine[21,22] and athletic training[23] that is composed of 6 steps: (1) summarize the history and findings, (2) narrow the differential diagnoses, (3) analyze the differential diagnoses, (4) probe the preceptor, (5) plan the patient care, and (6) self-directed learning. The SNAPPS model focuses on differential diagnosis, clinical reasoning, self-directed learning, and structured case presentation.

Preceptor training should be the foundation for programs to educate preceptors on expectations, supervised autonomy, clinical skill integration, feedback techniques, strategic questioning, effective communication, and dealing with challenging students, in addition to the program's philosophy, policies, and structure.[12,13,24,25] Incorporating these specific clinical teaching models will encompass several different facets of clinical education, such as supervision, questioning, feedback, student engagement, and clinical reasoning, in an organized, intentional approach for the preceptor. These clinical teaching models are embedded in the Master Preceptor program but have also been described in other athletic training literature.[11,16,17,23,26–28]

The purpose of this study is to investigate the use of clinical teaching models in athletic training clinical education to see if and how often preceptors use them. Additionally, we will seek to understand how preceptors are being trained to use clinical teaching models in preceptor training. The research questions facilitating the design of this study are (1) Have athletic training preceptors completed institutional preceptor training focused on clinical teaching or the Master Preceptor training program? (2) Does preceptor training or experience level influence the type of clinical teaching models that preceptors use? and (3) What perspectives and beliefs do preceptors have about how preceptor training prepares them to be clinical educators including the use of clinical teaching models?

METHODS

Design

This study had a mixed-methods research design using 2 concurrent phases: a cross-sectional survey (phase 1) and virtual qualitative interviews (phase 2). Using concurrent mixed methods allowed for a comprehensive look at preceptor development and the utility of clinical teaching models.[29] The blended framework allowed for measurement of the use of clinical teaching models while simultaneously gaining a deeper understanding of a preceptor's knowledge and implementation of clinical teaching models in their daily preceptorship role. During the design and execution of this study, the Strengthening the Reporting of Observational Studies in Epidemiology[30] and Consolidated Criteria for Reporting Qualitative Research[31] reporting guidelines were used to ensure integrity. This study was approved by the institutional review boards at Fort Hays State University and Rocky Mountain University of Health Professions.

Participants

At the start of the study, the inclusion criteria were determined to include that each participant must (1) be an AT preceptor of a CAATE-accredited athletic training program, (2) have completed an institutional preceptor training workshop or module 2 of the Master Preceptor level 1 program that contains clinical teaching models at any point in their professional career, (3) have supervised at least one student in a preceptor role within the past 2 academic years, and (4) have served as a preceptor for 2 years or more. For participants to be included in phase 2 interviews, they must have completed the phase 1 survey.

Respondents in phase 1 were preceptors affiliated with bachelor's- and master's-level professional CAATE-accredited programs and were recruited using purposeful convenience sampling methods from 2 different sources. Participants were primarily targeted from NATA Districts 1, 2, 4, 5, and 11, as these regions were geographically represented by the authors, to help increase recruitment, plus these 4 districts alone contained 54% (200 of 365) of the CAATE-accredited programs nationally at the time of this study.[32] To further encourage survey participation towards the end of an initial 8-week data collection period, preceptors were recruited through colleagues at a doctorate-granting institution with a significant number of alumni or current students connected to accredited athletic training programs. In the 5 NATA districts, 4000 preceptors representing 200 athletic training programs were estimated to provide an approximate sample size of 251 preceptors ($P < .05$, $\pm 6\%$)[33] to obtain statistical power. The exact number of preceptors in total or per program is not made publicly available by the CAATE. However, only 165 survey responses were returned after 5 months of data collection. The data collection window was extended beyond the initial 8-week time period set at the beginning of the study as a result of low participation. Reminder emails were sent every 2 weeks to program directors or coordinators of clinical education asking them to forward the survey invitation to their preceptors and encouraging their participation. During this time, preceptors were simultaneously heavily engaged in patient care with both fall and spring sports in overlapping in-season activity because of the COVID-19 pandemic. A response rate is unknown, as the exact number of invitation letter recipients is not known.

Participants in phase 2 were recruited from phase 1 survey respondents. Forty-eight participants indicated an interest in participating in an interview. Participants were chosen using purposeful sampling methods that ensured that a diversity of preceptor practice settings, genders, and years of experience were represented. Data saturation was determined after 10 interviews were completed as no new themes were introduced. The interview participants represented 6 women and 4 men, all employed in the university/college, clinic, or secondary school practice settings.

Instruments

In phase 1, the Clinical Teaching Models Survey was created with 3 areas: (1) participant demographics, (2) what components of teaching model preceptors use, and (3) how often preceptors use a clinical teaching model (Appendix). The survey instrument contained 32 nominal or scale data–type questions along with 1 open-ended question, with an average response time of 8 to 10 minutes. Items asking about clinical teaching models were coded using their respective model(s). Content validity was established using a 3-person expert panel in athletic training and medical education by having the panelists evaluate each of the questions to determine if it accurately portrayed the characteristics of a particular clinical teaching model(s). Each panelist had expertise in 1 of the 3 clinical teaching models used in this study, as determined by their publication or presentation scholarly activity. A Validation Rubric for Expert Panel was distributed to the panel to assess instrument content validity and organize feedback on the survey instrument.[34] On the Validation Rubric for Expert Panel, a cutoff score of 3 or higher on the rubric's Likert scale was established to determine if survey questions were acceptable. Several revisions were made, including adding a question on formal preceptor education, eliminating double-barreled questions, better aligning survey coding, and improving question clarity.

A pilot survey was used to establish face validity and internal reliability with a convenience sample of preceptors. In the pilot study, 16 responses were submitted; however, 3 responses were excluded for not meeting the inclusion criteria previously described. These responses were not included in the final data. The Cronbach α of the pilot survey was 0.929, suggesting high internal consistency among the question items.[35] The item-total Cronbach α ranged from 0.919 to 0.938.

Figure 1. Interview guide. Semistructured interview guide used during the qualitative portion of this study. Abbreviations: NATA, National Athletic Trainers' Association; SQF, Supervision, Questioning, Feedback model.

1) How long have you been serving as a preceptor?
2) In what athletic training setting do you serve as a preceptor?
3) Why did you initially want to become a preceptor?
4) What aspects of being a preceptor do you enjoy?

Now I would like to ask your experiences with clinical teaching and clinical teaching models.

5) How would you describe your clinical teaching style as a preceptor?
    a. What instructional methods have you found to be effective during clinical teaching? Can you explain why you find those methods to be effective?
    b. What instructional methods have you found to be ineffective during your clinical teaching? Why are those methods ineffective?

6) What clinical teaching models do you utilize as a preceptor?
    a. Are you familiar with any of the following clinical teaching models…?
        i. One-minute preceptor?
        ii. Supervision, Questioning, Feedback model or the SQF?
        iii. SNAPPS models?
    b. How did you learn about these clinical teaching models?
    c. How comfortable are you using those clinical teaching models?

I would like to ask you about your perceptions on models of clinical teaching.

7) What benefits do you see in student learning when using clinical teaching models?
8) Please describe the benefits you see as a preceptor in using clinical teaching models?
9) What barriers or drawbacks do you believe exist when using clinical teaching models?

Next I would like to ask you a few questions about preceptor training related to clinical teaching.

10) Have you participated in preceptor training at your institution focusing on clinical teaching? Have you participated in the Master Preceptor Level I training offered through the NATA?
    a. How much of your preceptor training focuses on clinical teaching?
    b. During preceptor training do you find value in learning about clinical teaching?
11) Do you feel preceptor training prepares you for how to utilize clinical teaching models?
12) What are your beliefs on how preceptor training could improve upon teaching how to use of clinical teaching models?

Participants in phase 2 completed a semistructured interview. An interview guide was developed with questions focusing on (1) perceptions of the use of feedback models on student learning, (2) barriers that exist in using these models, (3) benefits of using feedback models, and (4) how preceptor training can be improved (Figure 1). Content validity was established by 2 experts with a proven record of scholarly activity in clinical education and qualitative interview methods. Upon review, question clarity was modified to reduce confusing question intent. Questions were added to include introductory questions, preceptor training, and generalized questions on clinical teaching. After the expert review, 3 trial interviews were completed to ensure high-quality interview skills and participant comprehension of the questions. These trials were not included in the final data analysis. After receiving trial participant feedback, a couple of questions were modified to provide further clarity, and transitional statements between topics were added.

Procedures

Participants were recruited to complete the Clinical Teaching Models Survey through their respective program's coordinator of clinical education or program director because preceptor contact information is not publicly disseminated. Coordinators of clinical education and program directors were emailed a survey invitation letter to forward to their preceptors. The invitation letter contained a URL link to the survey on Qualtrics. To take the survey, participants had to provide electronic consent on the first page before starting the survey. Participants completed the survey questions and ended with the last page of the survey asking participants to participate in a voluntary follow-up interview. If they chose yes, they were automatically redirected to a separate survey to collect their contact information. A debriefing page was provided to all participants at the end of the survey. No incentives were given for participation.

Participants choosing to complete the interview were contacted by one researcher (J.G.) to schedule an interview within 1 week of the participant completing the Clinical Teaching Models Survey. The informed consent was emailed to the participant at least 24 hours before the interview. Interviews were conducted using the Zoom videoconferencing software to record and the Zoom transcription service to transcribe the interviews. Participants were made aware of the general areas of interview questions; however, they were not given the interview guide before the interview. One researcher (J.G.) completed all the interviews.

Data Analysis

Descriptive statistics were compiled from the survey respondents. Phase 1 data analysis entailed performing several χ^2

Table 1. Survey Participant Demographics, N = 165

	n (%)
Degree level	
Master's	106 (64.2)
Bachelor's	59 (35.8)
Total	165 (100)
Athletic training setting	
Secondary school	64 (38.8)
University/college	78 (47.3)
Clinic/hospital	19 (11.6)
University and secondary school	1 (0.6)
University and clinic	1 (0.6)
Secondary school and clinic	1 (0.6)
Secondary school, clinic, and performing arts	1 (0.6)
Total	165 (100)

analyses of independence tests to determine if any relationship existed between years of experience and the use of clinical teaching models. Additionally, χ^2 analyses of independence tests were used to explore if the variables of preceptor training type and use of a clinical teaching model were related. The α level was set at .05. Statistical analysis was completed using Intellectus Statistics software because it was the statistical software adopted by the primary investigator's institution. Missing data were completed using the data imputation function of the Intellectus software.

To code the data in phase 2, a phenomenological method was used, as best described by Creswell and Poth.[36] Data immersion was the most important part of the coding process, and was done by reading each transcript several times before coding. One researcher (J.G.) completed all the interviews, allowing for immersion to happen throughout the data collection and analysis process. Saturation was determined as the constant comparison of transcripts was completed, and no new information was shared during the final interview. The coding of each transcript was completed by labeling chunks of data with keywords or phrases to represent their overall meaning; on subsequent readings, similar labels were grouped to develop themes. Trustworthiness and credibility were established through several mechanisms, including mixed-methods design (data triangulation), basic member checks, multiple analyst triangulation, and a peer expert review. After transcription, each transcript was sent back to the participant for member checking to confirm the transcript was accurately transcribed to reflect the actual conversation. If no response was received in 1 week, it was assumed the transcript was accurate. Two researchers (J.G. and S.H.) completed an independent coding process, as described above, then agreed on the coding results before sharing them with the peer reviewer. A peer review was completed by a qualitative methods expert (S.M.S.) who had published significantly on the topic of clinical teaching in athletic training. Half of the transcripts with codes, themes, and supporting quotes were provided to the peer reviewer to verify that the codes, themes, and quotes accurately reflected the completed data analysis. Upon completion of qualitative data analysis, the findings were compared against the quantitative results, and it was determined that the quantitative findings supported the qualitative themes. Results from both phases were then merged, where applicable, to give richer support to each theme. The quantitative and qualitative themes and combined analysis were agreed upon by all authors.

Table 2. Prior Preceptor Training History

	No. (%)
Institutional preceptor training	
Yes	113 (68.5)
No	52 (31.5)
Master preceptor training	
Yes	40 (24.2)
No	125 (75.8)

RESULTS

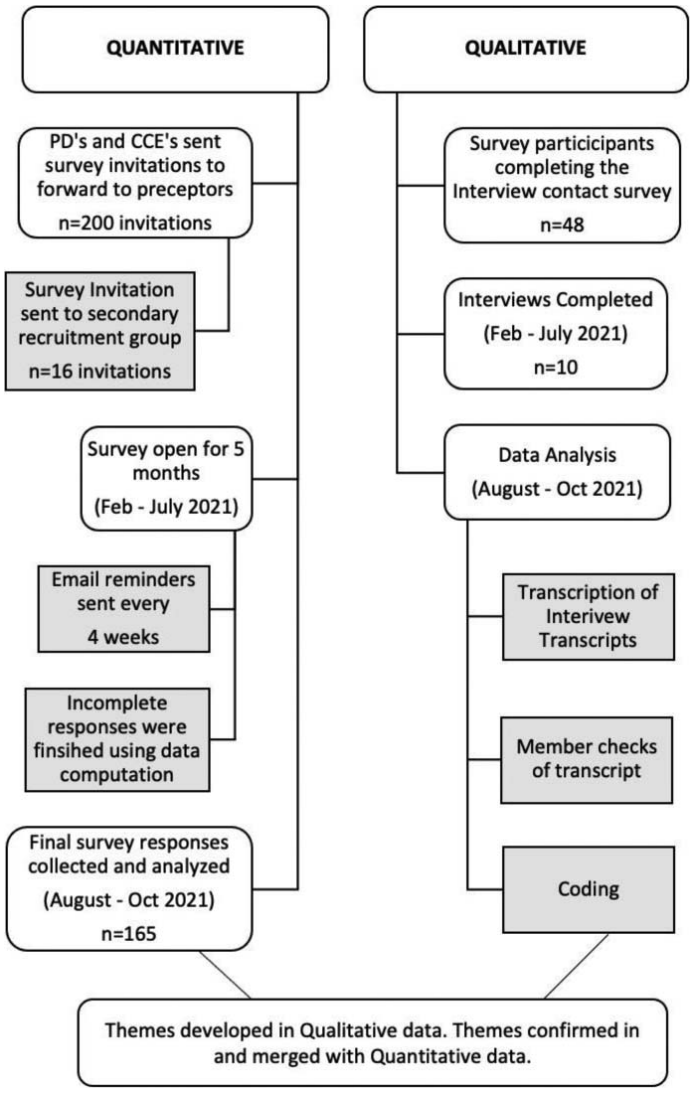
From the 165 respondents in phase 1, there were 140 complete responses, with the remaining missing data completed with data imputation. Participants were preceptors affiliated with CAATE-accredited professional-level athletic training programs at the master's degree (n = 106, 64.2%) or the bachelor's degree (n = 59, 35.8%) level, both currently permissible by the CAATE (Table 1). The athletic training employment settings represented were university/college (n = 78, 47.2%), secondary school (n = 64, 38.8%), clinic/hospital (n = 19, 11.6%) and then 1 participant each in the university/secondary school, university/clinic, secondary school/clinic, and secondary school/clinic/performing arts settings (see Table 1). Participants had an average of 10.27 ± 8.65 years of experience as a preceptor. Participants supervised, on average, 2 ± 1 athletic training students per day and 2 ± 2 students per clinical rotation. To answer the first research question, when examining preceptor training participation, 113 participants (68.5%) had completed institutional preceptor training related to clinical teaching, and only 40 participants (24.2%) had completed the Master Preceptor level 1 program (see Table 2). Of those participants, 23 respondents (14%) reported completing both institutional preceptor training and the master preceptor training workshop. The Cronbach α statistic indicated strong survey item internal consistency (0.93) with an item-total range[35] of 0.92 to 0.94.

In phase 2, 10 preceptors (6 female, 4 male) with an average of 12 ± 10 years of experience as a preceptor completed the interviews. Four participants worked in the secondary school setting, 3 in the university/college setting, and 3 in the clinic/hospital setting. See Table 3 for interview participant

Table 3. Interview Participant Demographics, N = 10

Participant Pseudonym	Experience as a Preceptor (y)	Athletic Training Employment Setting
Joe	6	College
Helen	3	Secondary school
Bob	23	Secondary school
Tim	30	Clinic
Erin	20	Clinic
Don	6	Clinic
Tammy	15	College
Shirley	5	College
Nancy	5	Secondary school
Kim	2	Secondary school

Figure 2. Methodology flow diagram. Flowchart showing recruitment, enrollment, and analysis of participants. Abbreviations: CCE, coordinator of clinical education; PD, program director.



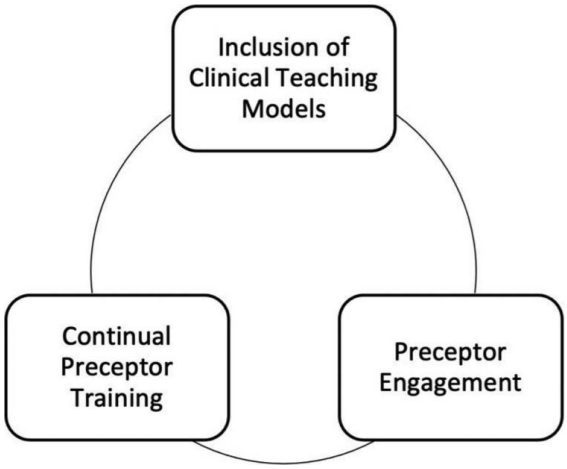
demographics and Figure 2 for the methodologic flow diagram.

Phase 1

From our χ^2 analysis of independence results, we found that a preceptor's use of specific clinical teaching models was related to either the type of preceptor training completed or a preceptor's years of experience. These results addressed our second research question. Preceptors who had completed the Master Preceptor program were more likely to use the OMP model, χ^2_2 (N = 165) = 12.456, P = .002. Additionally, the SNAPPS model was commonly used by preceptors who were Master Preceptor workshop participants, χ^2_2 (N = 165) = 6.338, P = .042. Participants' having longer years of experience was significantly related to their using the OMP model, χ^2_8 (N = 165) = 19.425, P = .013.

Several χ^2 analyses of independence results illustrated that no relationships existed between these variables. The use of the SQF model was not related to Master Preceptor training participants, χ^2_2 (N = 165) = 4.129, P = .13. Institutional preceptor training was not associated with preceptors using any specific clinical teaching model. Institutional preceptor training results for preceptors using the OMP was χ^2_2 (N = 165) = 1.232, P = .054, for the SQF Model was χ^2_2 (N = 165) = 4.005, P = .13, and for the SNAPPS model was χ^2_2 (N = 165) = 1.355, P = .51. Furthermore, a preceptor's years of experience did not show a relationship with using the SQF model, χ^2_8 (N = 165) = 9.476, P = .3, or the SNAPPS model, χ^2_8 (N = 165) = 13.637, P = .09.

Figure 3. Themes of what preceptors' desire.



Phase 2

To illustrate our third research question, 3 major themes emerged from our study: (1) inclusion of clinical teaching models, (2) preceptor engagement, and (3) continual preceptor training (Figure 3).

Inclusion of Clinical Teaching Models. Our participants discussed how institutional preceptor training lacked specificity to clinical teaching models and was more focused on expectations or program policies and procedures. Joe stated, "It [preceptor training] didn't talk about clinical teaching as much, it was more of like the roles, responsibilities, expectations. . .It's usually very brief in nature." When asked about time spent in preceptor training on clinical teaching, Kim responded, "Not really. The only thing we pretty much had was their guidelines, what they expected of me as a preceptor, and what they expected out of the student." Similarly, Erin said the following about the time spent discussing clinical teaching during preceptor training, "I'd say comparatively very little. It's been more about what is needed for the students, and can you hit those levels of giving them those needs." When clinical teaching models were discussed in institutional preceptor training, it was ordinarily brief, as Shirley explains:

> *We talked about the One-Minute Preceptor but after that we just go through expectations of what's expected of us and that typically includes making sure we're approving A-Track hours, making sure we're approving patient encounters, making sure that we're completing student evaluations, but we're not necessarily taught how to teach them or again how to bridge that gap from the classroom to the clinical setting.*

Our data illustrated that institutional preceptor training may not focus enough on clinical teaching strategies or clinical teaching.

Additional training such as postprofessional degrees or courses such as the Master Preceptor program may aid in the development of additional clinical teaching practices. Preceptors who have attained advanced knowledge in clinical teaching have conveyed a positive effect on their clinical teaching. Joe completed the Master Preceptor program and reported that it helped him improve clinical teaching by "getting the continuous feedback and then asking questions, based on their knowledge level" even though he was still learning how to fully implement these clinical teaching models. Similarly, Nancy reported taking athletic training educator courses in her clinical doctorate program that "completely changed the way that I was working as a preceptor," and followed up with, "Now my approach is much more structured goal setting, debriefing, or using the One-Minute Preceptor."

Preceptor Engagement. Participants identified active engagement as a technique to help improve preceptor training. Nancy summed up the desire to incorporate experiential learning by stating,

> *Preceptor training needs to be much more interactive across the board and making sure that we are training preceptors through maybe like role-playing, situational learning, and including them in high-fidelity simulations.*

Nancy also suggested incorporating the students into role-playing during preceptor training as well to expose them to learning techniques. Helen stated preceptor training should be "more in-depth, like a Q and A [or] what problem did you have, and how do we overcome that." Discussing unique situations and how to handle them effectively provides a means of learning from other preceptors' experiences. Conversely, Don reported, "They had preceptor training via email as a regular newsletter." Preceptors preferred experiential learning during preceptor training, similar to how students prefer being taught.

Continual Preceptor Training. Many athletic training programs may conduct preceptor training annually or biannually. However, preceptors may enthusiastically favor an increased frequency of preceptor training by presenting a variety of topics that motivates participation in professional development. Helen shared,

> *Having a 30-minute presentation to go over this teaching model this year and then next year we will touch on a different one, that way we are not getting too much of the same information because we do it every year.*

More frequent preceptor training may help keep preceptors engaged and help them acclimatize to their role. Nancy suggested that "doing it not just once in the summer but bringing preceptors into an athletic training program on a regular basis and doing microtraining or focused training and individualized meetings" would help develop desired preceptorship skills. Tammy emphasized,

> *I think forcing a little bit more in-depth training on particular styles or models with actual names would be helpful because I don't think we all take it upon ourselves to take the time to dive into some of those nonrequired things.*

DISCUSSION

This study was completed to investigate how preceptors are trained to use clinical teaching models and how preceptor training prepares them for their role as educators. Our study found several important themes that emerged: (1) inclusion of clinical teaching models, (2) preceptor engagement, and (3) continual preceptor training.

Inclusion of Clinical Teaching Models

The most significant finding of our study is the continued lack of including clinical teaching principles in preceptor training.[6] Many preceptors report learning novice clinical teaching methods from observing other preceptors, via self-directed learning, or from past interactions as a student with a preceptor.[12] Most participants in our interviews illustrated that a knowledge gap exists in delivering effective clinical teaching strategies, with a majority of preceptors lacking education on clinical teaching practices. Instead, institutional preceptor training weighs more heavily on the preceptor's daily responsibility to maintain program policy and procedure compliance and the program's expectations of preceptors. This finding supports a previous report by Nottingham[6] where preceptors felt preceptor training did not convey the competency of clinical teaching knowledge. Henning and Weidner[37] found that 35% of preceptors reported feeling unprepared for their role after completing institutional preceptor training, with no recent reports disproving this finding. Additionally, preceptors have previously clearly identified clinical teaching and learning as one of the top areas of need in professional development.[38] This finding stands in stark contrast with the intention of the CAATE standards[7] that preceptors be educated regularly and evaluated on the effectiveness of clinical instruction and student learning. A pivotal role of a preceptor is clinical teaching, yet they are placed into this role with minimal or no training on how to provide an authentic educational experience. To produce high-quality clinical experiences that benefit student learning and to evaluate a preceptor's quality of instruction fairly, programs should provide the necessary training providing the fundamental best practices of clinical teaching and andragogy.

Providing the foundation of clinical teaching to preceptors through preceptor training has many benefits in transitioning them to being clinical educators. The use of these clinical teaching models will give preceptors a much deeper understanding of supervised autonomy,[17,28] asking progressively more difficult questions,[16,39] providing more meaningful feedback,[16,27] integrating clinical reasoning and clinical decision-making skills,[23] and self-reflection of clinical practice.[23] The quality of clinical education will be much improved as preceptors are equipped to provide an authentic experience and challenge the students in their professional growth. Preceptors with the foundational knowledge of clinical teaching models can operate at an educator level, as it provides the opportunity to provide a structured, authentic, and education-oriented approach to clinical education.

As a preceptor feels more equipped and more confident in being a clinical educator, it helps to decrease the amount of role strain they experience in being both health care provider and educator. During clinical practice, a clinician can integrate a student into a patient experience better by understanding how to engage through questioning, exploring clinical reasoning rationales, or equipping the student to display some autonomy as they advance in skill level. As a preceptor better understands a student's knowledge, clinical reasoning skills, and skill level, they may feel more comfortable allowing the student to gain authentic, hands-on experience. After a patient encounter, the preceptor can then follow up with a student to reflect. By decreasing role strain, the ability of preceptors to provide quality clinical experiences may be enhanced.[6]

Preceptor Engagement

Our results show active engagement may be lacking in preceptor training. In our study, participants suggested role-playing as a great way to help demonstrate and actively practice these techniques rather than reporting on the techniques in a presentation as a means of passive learning. Our participants identified that group discussion among peers helps them view how colleagues may approach unique situations or learn novel teaching tips. One participant reported receiving preceptor training solely through a monthly newsletter sent by program administrators, never engaging in face-to-face training.

Demonstrating to preceptors how to mentor students in unique circumstances with immediate feedback and group discussion may help facilitate experiential learning to align with the kinesthetic learning style often favored by ATs. This type of preceptor training was shown to effectively transform preceptor behavior and perceptions of preparedness when used by one athletic training program.[40] Another athletic training program that used a preceptor training program rooted in observation and feedback demonstrated that after interventions from a clinical instructor educator, preceptor behavior significantly increased the quality of clinical instruction and student learning.[41]

The delivery medium used in preceptor training should mimic the preferred learning style that the learner embodies best and demonstrate best practices in teaching methodology. Using teaching strategies that preceptors are expected to use when educating their students may help embed these strategies within a preceptor's clinical teaching approach.[24] Therefore, conducting preceptor training solely via PowerPoint lectures, videos, or assigned readings may not be the best delivery method. Our participants reported that creating active engagement by creating active learning opportunities would help improve the effectiveness of preceptor training. Using a combination of interactive lectures, hands-on simulations, and facilitated group discussions may present an optimal solution for hosting preceptor training.

Continual Preceptor Training

The desire for preceptor training that is ongoing, progressive, and frequent is apparent from the preceptors' responses. Conducting preceptor training annually may not be sufficient in establishing necessary competency in clinical teaching. Our participants report having preceptor training infrequently or on topics that may not meet their desired learning needs. As one participant tried explaining, a new topic may need multiple sessions over time to instill the framework into practice. Presenting a clinical teaching model in one sitting is not sufficient, as the content is new, is multifaceted, and needs deeper exposure and practice over time to develop understanding. Preceptors are looking for consistent interaction with program administrators to understand how to mentor students in their clinical experiences and increase their competence. Preceptors should be given opportunities to provide input on preceptor development topics, delivery systems, and frequency to help meet the learning needs of preceptors.[24] Hosting preceptor training monthly, quarterly, or multiple times per year and in a combination of large-group, small-group, and individual settings may facilitate preceptor learning needs best.

Limitations and Future Directions

Our study has several limitations. The survey sample size was estimated to be 251 participants ($P < .05$, $\pm 6\%$); however, we had 165 participants. Therefore, the survey sample size did not meet statistical power. This might have resulted from the timing of data collection: February to July 2022 during a global pandemic. Data collection occurred when preceptors were exceptionally busy with athletic training coverage of both fall and spring sports overlapping seasons during the COVID-19 pandemic. The survey and interviews did not collect demographic data on the type of clinical education preceptors provided (traditional versus immersive). The distribution of survey invitations also is a factor because it is unknown exactly how many coordinators of clinical education or program directors forwarded the email to their respective preceptors or if any preceptors did not receive the invitation because of spam filtering. The precise number of preceptors in the targeted geographical areas is unknown. The truthfulness of the survey or interview responses is assumed to be accurate. The CAATE requires preceptor training for preceptors; however, each athletic training program conducts preceptor training differently, so the clinical teaching foundational knowledge may be presented differently across programs.

For future studies, several areas need to be explored. First, the teaching effectiveness of preceptors using clinical teaching models needs to be investigated in athletic training education, because this is documented in other health care professions but not athletic training. Second, the perceptions of coordinators of clinical education should be investigated to understand their viewpoints on further integrating clinical teaching models into clinical teaching. Lastly, preceptor preparation should be evaluated with the transition to immersive clinical education in athletic training.

CONCLUSIONS

Preceptors identified in our study and in previous reports[6,12,37] that they feel unprepared and unqualified for their role as a preceptor in one of their most significant roles, clinical teaching. To answer our first research question, only 68% of preceptors completed institutional preceptor training including clinical teaching models and only 24% had completed the Master Preceptor program. This contrasts with the spirit of

the CAATE standards identifying the necessity of preceptor development through ongoing training and evaluation of the preceptor's instructional quality.[7,38] Given a lack of clinical teaching knowledge and the purported lack of foundational training, preceptors cannot reasonably expect to provide a meaningful, stimulating, educational clinical experience to athletic training students. Providing adequate training on the fundamentals of clinical education will transform preceptors from a supervisor to an educator role, thereby further leveraging their positive influence on students and their professional development.

Preceptor training should facilitate the professional growth of preceptors to help attain programmatic goals, student success, and quality of clinical education. To answer our second research question, those preceptors with longer years of experience or those completing advanced preceptor training used clinical teaching models such as the OMP or the SNAPPS model more frequently. To answer our third research question, preceptors expressed several beliefs on improving preceptor training, including active engagement and more frequent training, but the most desirable was including clinical teaching strategies. Preceptors expressed the desire and willingness to learn more effective clinical teaching strategies, such as clinical teaching models through active engagement during preceptor training. Preceptors should be given continuous, individualized training so learning may occur over time. Simultaneously, students will reap the benefits of improved clinical instruction. The ability of a preceptor to provide teachable moments effectively and efficiently to the students affects every aspect of success in an athletic training program; therefore, programs should focus on improving the quality of clinical teaching by providing adequate and ongoing preceptor professional development in clinical teaching to further enhance the educational intent of clinical education.

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Appendix. Clinical teaching models survey. The survey instrument was created and validated for use in this study. Abbreviations: NATA, National Athletic Trainers' Association; OMP, One-Minute Preceptor model.

Demographic Questions

Please answer the following questions concerning your role as a preceptor for a professional-level Athletic Training Program.

1. Identify the athletic training setting(s) in which you currently serve as a preceptor (choose all that apply):
   - University/College
   - Secondary School
   - Clinic or Hospital
   - Professional Sports
   - Performing Arts
   - Military/Public Safety
   - Occupational Health

2. What degree level of athletic training students do you supervise at the time of this survey? Bachelor's Master's

3. Did you supervise professional-level athletic training students between August 2018 and August 2020? Yes No

4. How many years of experience do you have as a preceptor: 1 2 3 4 5 6 7 8 9 10+

5. On average, how many athletic training students do you supervise?
   Per day: 1 2 3 4 5 6 7 8 9 10+
   Per clinical rotation: 1 2 3 4 5 6 7 8 9 10+

6. Do you have any formal degree preparation in the field of education or teaching? Yes No
   a) If yes, please list your degree and field of study.

7. Have you completed either of the following types of preceptor training workshops?
   a) At your own institution specifically discussing methods of clinical teaching? Yes No
   b) NATA workshop "The Master Preceptor", specifically module 2 discussing models of clinical teaching including the One-Minute Preceptor, or the Supervision, Questioning, and Feedback models? Yes No

8. Have you used any of the following clinical teaching models in your role as a preceptor?

One-minute Preceptor Model	Yes	No	Unsure
Supervision, Questioning, Feedback (SQF) Model	Yes	No	Unsure
SNAPPS Model	Yes	No	Unsure

The following terms are defined for use in this survey in the following manner:

Feedback: Providing a student with a comparison of their performance on a task compared to what is expected or a standard of performance to help them improve their clinical skills and knowledge.[1,2]

Positive feedback is given when the student's performance if satisfactory and reinforces the student's action.

Corrective feedback is given when the student's performance is incorrect or needs improvement.

Clinical Reasoning: the thought process used by students and clinicians when determining diagnostic or therapeutic intervention decisions by incorporating the concepts of knowledge, cognition, and metacognition [3, 4]

Supervision: "Preceptors must be on-site and have the ability to intervene on behalf of the athletic training student and the patient. Supervision occurs along a continuum that allows a student to move from interdependence to independence based on the student's knowledge and skills as well as the context of care." [5]

Please answer the following questions on your clinical teaching by using the following rating scale:

Very Frequently (Multiple times per day)	Frequently (Once per day)	Occasionally (3-4 times per week)	Very Rarely (1-2 times. per week)	Rarely (1-2 times per month)	Never
5	4	3	2	1	0

9. How often as a preceptor do you:
   a) give a student positive feedback during clinical education? 5 4 3 2 1 0
   b) give a student corrective feedback during clinical education? 5 4 3 2 1 0
   c) ask follow-up questions on a specific clinical skill the student performed? 5 4 3 2 1 0
   d) talk to the student about his/her clinical reasoning strategies? 5 4 3 2 1 0
   e) have a student approach you during clinical education for feedback or mentorship? 5 4 3 2 1 0

10. How often do you use clinical teaching that:
   a) has the student focus on determining a differential diagnosis'? 5 4 3 2 1 0
   b) has the student systematically present patient case information to you? 5 4 3 2 1 0
   c) has the student determine their own plan of care based upon a patient's case? 5 4 3 2 1 0
   d) is conducted by the student leading the clinical conversation? 5 4 3 2 1 0
   e) is conducted by the preceptor leading the clinical conversation? 5 4 3 2 1 0
   f) adapts level of supervision based upon the students' skill level? 5 4 3 2 1 0
   g) provides your prior experiences for the student to learn from? 5 4 3 2 1 0
   h) allows the student to self-identify positive behaviors during a patient interaction? 5 4 3 2 1 0
   i) allows the student to self-identify mistakes during a patient interaction? 5 4 3 2 1 0
   j) allow the student to provide a rationale for their own clinical decision making? 5 4 3 2 1 0
   k) allow the student to convey their own confidence level during patient interactions? 5 4 3 2 1 0
   l) asks questions at different level of critical thinking following a patient interaction? 5 4 3 2 1 0
   m) provides feedback to the student based upon performance or skill level? 5 4 3 2 1 0
   n) provides the student immediate feedback on their clinical performance? 5 4 3 2 1 0

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