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Preferences for and Barriers to Formal and Informal Athletic Training Continuing Education Activities

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Context: Our previous research determined the frequency of participation and perceived effect of formal and informal continuing education (CE) activities. However, actual preferences for and barriers to CE must be characterized.

Objective: To determine the types of formal and informal CE activities preferred by athletic trainers (ATs) and barriers to their participation in these activities.

Design: Cross-sectional study.

Setting: Athletic training practice settings.

Patients or Other Participants: Of a geographically stratified random sample of 1000 ATs, 427 ATs (42.7%) completed the survey.

Main Outcome Measure(s): As part of a larger study, the Survey of Formal and Informal Athletic Training Continuing Education Activities (FIATCEA) was developed and administered electronically. The FIATCEA consists of demographic characteristics and Likert scale items (1 = *strongly disagree,* 5 = *strongly agree*) about preferred CE activities and barriers to these activities. Internal consistency of survey items, as determined by Cronbach α, was 0.638 for preferred CE activities and 0.860 for barriers to these activities. Descriptive statistics were computed for all items. Differences between respondent demographic characteristics and preferred CE activities and barriers to these activities were determined via analysis of variance and dependent *t* tests. The α level was set at .05.

Results: Hands-on clinical workshops and professional networking were the preferred formal and informal CE activities, respectively. The most frequently reported barriers to formal CE were the cost of attending and travel distance, whereas the most frequently reported barriers to informal CE were personal and job-specific factors. Differences were noted between both the cost of CE and travel distance to CE and all other barriers to CE participation ($F_{1,411} = 233.54$, $P < .001$).

Conclusions: Overall, ATs preferred formal CE activities. The same barriers (eg, cost, travel distance) to formal CE appeared to be universal to all ATs. Informal CE was highly valued by ATs because it could be individualized.

Key Words: professional development, online learning, networking, informal continuing education

Key Points

- In general, athletic trainers favored formal continuing education activities, particularly hands-on workshops and online offerings, over informal activities. Common barriers to formal continuing education were cost and travel distance.
- However, informal continuing education activities, including networking, reading professional journals, teaching athletic training classes, and pursuing fellowships and other clinical experiences, were also considered valuable.
- Athletic trainers must understand their learning needs, preferences, and perceived barriers. Continuing education providers must offer opportunities that are both versatile and realistic.

Continuing education (CE) for athletic trainers (ATs) consists of educational activities that maintain or develop the knowledge, skills, performance, and professional relationships needed to provide high-quality patient care.[1] These CE activities must be self-directed, with content and learning methods that are specific to the learner's needs.[2] Improving knowledge, skill, and patient care are the driving factors behind engagement in CE activities. Therefore, CE should attempt to provide practical information that ATs can apply in their daily work.[3]

Researchers[1,4–9] have demonstrated that formal (ie, approved for CE credit) and informal (ie, not approved for CE credit) activities are both important for improving professional practice. In the first part of this article series,[4] we determined that certified ATs completed more informal (eg, supervising students, teaching related classes, professional networking) than formal (eg, attending a state, regional, or national workshop or symposium; publishing an article in a peer-reviewed journal) CE activities. The primary informal CE activity was reading athletic training journals (other examples were mentoring a colleague, holding a professional office, and supervising a student during clinical experiences), whereas formal CE activities included attending a Board of Certification (BOC)–approved workshop, seminar, or professional conference not conducted by the National Athletic Trainers' Association (NATA) or its related affiliates or committees. Informal CE activities were perceived to improve

clinical skills or abilities and attitudes toward patient care; formal CE activities were perceived to increase knowledge.[4] Athletic trainers and other health care professionals should pursue the types of CE activities that are most appropriate for their learning needs.[2] When CE activities are selected, both formal and informal activities should be considered.

Continuing education providers should offer the type of learning activities preferred by health care professionals.[10,11] These CE activities typically range from conference lectures (a formal CE activity) to the professional dialogue (an informal CE activity) that often accompanies these lectures. We should also recognize that other informal CE activities, such as professional networking and reading professional journals, can be preferred by ATs and other health professionals.[4,7,12–18] These informal CE activities are completed and valued because they are more holistic and individualized to meet a practitioner's learning needs than is formal CE.[6]

In addition to CE preferences, the barriers that prevent practitioners from participating in CE also must be appreciated. In this way, more appropriate CE activities can be developed and implemented.[19] For instance, poor content[20–25] and lack of relevance of the CE activity to clinical practice[12,25] have been identified in nursing and physical therapy studies as common barriers to CE participation. Additionally, a lack of financial support to attend CE activities and practice setting factors (eg, geographic location, time away from patient-care responsibilities) are important barriers to CE participation.[12,22,25–28]

To fully describe CE participation effects, benefits, and barriers for ATs, we chose to present our findings in 2 articles. In the first,[4] we discussed ATs' participation in formal (ie, CE activities that are awarded CE credit by the BOC) and informal (ie, CE activities that are not awarded CE credit by the BOC) CE activities and the perceived effects of these activities on professional practice with regard to improving knowledge, clinical skills and abilities, attitudes toward patient care, and patient care itself. In this article, we address preferred CE activities and barriers to those activities. With this information, CE activities can be better understood and positioned to improve ATs' knowledge, skills, attitudes, and patient care.

METHODS

The methods used in this article are the same as those described in part I of this series[4] and include survey responses from a geographically stratified sample of 427 ATs from all NATA districts. However, in the first article, only the items pertaining to participation in formal and informal CE activities and the perceived effects of these activities on professional practice were presented. In this article, we include the remaining items on the Survey of Formal and Informal Athletic Training Continuing Education Activities (FIATCE), which pertain to preferred formal and informal CE activities and barriers to participating in those CE activities.

Procedures

Institutional review board approval was obtained before the study began. To improve the response rate,[29] we distributed a "notice of selection" via e-mail to all ATs in the sample. The message introduced the nature of the upcoming investigation and encouraged their future participation. Approximately 4 days later, all ATs in the sample were e-mailed again and invited to participate in the investigation. This invitation included the purpose of the investigation, confidentiality statement, contact information for the principal investigator, instructions for completing the online survey, and the Web address for the survey. Informed consent was implied upon completion and submission of the survey.

Identifiers were used to track submitted surveys. We followed up with e-mails to nonrespondents for an additional 3 weeks and then sent paper copies of the survey through postal mail to all remaining nonrespondents.

Instrument

The FIATCEA was developed for this investigation and included items with a 5-point Likert scale (1 = *strongly disagree,* 5 = *strongly agree*). The survey contained 15 items about preferred CE activities (eg, professional conferences or seminars, clinical workshops, professional networking, mentoring a colleague) and 11 items about barriers to CE participation (eg, cost of attending CE, lack of financial support from employer). Eight items addressed demographic characteristics of the respondent (eg, NATA district, practice setting, years of experience as an AT).

Face and content validity were established with 5 athletic training educators who were considered content experts in athletic training continuing education. Four were members of the BOC Task Force for Continuing Professional Education, and the fifth was an educational researcher. Survey questions were assessed for content and clarity. Items were clarified, and additional items were added as needed.[4] Reliability was measured using the Cronbach α to determine internal consistency of survey items. The α coefficients were 0.638 and 0.860 for the preferred type of CE activities and barriers to CE participation sections, respectively.

Data Analysis

We computed descriptive statistics on all survey items. An analysis of variance (ANOVA) and dependent *t* tests were used to analyze differences between select demographic characteristics of the ATs and their preferred CE activities and barriers to CE participation. A repeated-measures ANOVA was performed to determine differences between the preferred CE activities. The α level was set at .05 for all analyses. A Bonferroni correction was used to reduce the chance of type I error, resulting in an α level of $P < .002$. In addition, the Bonferroni test was used for pairwise comparisons. Data analysis was performed using SPSS (version 16.0; SPSS Inc, Chicago, IL).

Although this was not a qualitative study, we had enough comments to warrant qualitative analysis of the following survey questions:

> "List any additional preferred formal (ie, approved for CE) or informal (ie, not approved for CE) athletic training CE activities."

> "List any additional barriers that prevent you from participating in formal or informal athletic training CE activities."

Qualitative data were analyzed using interpretive coding.[30] This process involved categorizing individual comments into concepts. We then organized the concept categories into themes using pattern analysis[30] and assigned labels to capture their meaning. Three analysts evaluated the data to ensure trustworthiness and accurate interpretation.

RESULTS

Preferred Athletic Training CE Activities

Clinical workshops (4.47 ± 0.714) and professional conferences or seminars (4.26 ± 0.770) were reported as the preferred formal CE activities, whereas professional networking (3.88 ± 0.850) and reading professional journals (3.79 ± 0.795) were the preferred informal CE activities (Table 1). A dependent-samples *t* test revealed that respondents preferred formal CE activities ($t_{422} = 2.556$, $P = .011$) over informal CE activities. Most respondents (n = 391, 92.5%) agreed or strongly agreed that a hands-on clinical workshop was their preferred CE activity. In addition, 88.4% of respondents (n = 374) reported a strong preference for professional conferences and seminars. Only 95 respondents (23.0%) agreed or strongly agreed that research presentations or posters were preferred CE activities.

A 1-way ANOVA revealed no differences among the respondents by NATA district ($F_{9,395}$ range, 0.260–1.409, $P > .05$), years of experience in current practice setting ($F_{4,397}$ range, 0.758–1.892, $P > .05$), or the amount of money allocated by employer for CE ($F_{5,409}$ range, 0.217–1.825, $P > .05$) and their preferred CE activities.

Preferred CE activities differed among ATs employed in various practice settings. Specifically, a 1-way ANOVA demonstrated differences among the practice settings of the respondents and their preference for research presentations and posters ($F_{9,362} = 3.882$, $P < .001$), clinical case reports ($F_{9,367} = 4.583$, $P < .001$), conducting scholarly research ($F_{9,363} = 3.456$, $P < .001$), and reading professional journals ($F_{9,363} = 3.340$, $P = .001$). Bonferroni pairwise comparisons revealed that respondents from the college or university setting (mean = 3.24) preferred research presentations or posters more than did respondents from the high school setting (mean = 2.71, $P = .001$). Respondents from the college or university setting (mean = 3.88) also preferred clinical case reports more than did respondents from the high school (mean = 3.39, $P = .002$), sports medicine clinic (mean = 3.31, $P = .003$), or other (mean = 2.93, $P = .004$) practice settings. In addition, respondents from the high school setting (mean = 2.71) had less preference for conducting scholarly research than did respondents from the college or university (mean = 3.32, $P < .001$) or hospital (mean = 3.52, $P = .019$) settings. Furthermore, respondents from the college or university setting (mean = 4.02) preferred reading professional journals more than did respondents from the high school (mean = 3.57, $P = .001$) or other (mean = 3.33, $P = .049$) settings.

Preferred CE activities differed by the positions held by respondents within their practice settings. Specifically, a 1-way ANOVA revealed differences among respondents' positions in their practice settings and their preference for conducting scholarly research ($F_{5,326} = 3.782$, $P = .002$). Bonferroni pairwise comparisons demonstrated that full-time academic faculty (mean = 3.57) preferred conducting scholarly research more than did head (mean = 2.81, $P = .001$) or assistant or associate (mean = 2.89, $P = .021$) ATs.

Preferred CE activities differed among respondents by total years of clinical experience. A 1-way ANOVA identified differences among respondents' years of athletic training experience and their preference for panel discussions ($F_{4,398} = 4.445$, $P = .002$) and being mentored by a colleague ($F_{4,399} = 8.349$, $P < .001$). Bonferroni pairwise comparisons showed that respondents with more than 20 years of experience (mean = 3.82) preferred panel discussions more than did respondents with 1 to 5 (mean = 3.19, $P = .002$) or 6 to 10 years (mean = 3.11, $P = .001$) of experience. Respondents with 1 to 5 years of experience (mean = 3.84) preferred being mentored by a colleague more than did respondents with 6 to 10 years (mean = 3.28, $P = .002$) or more than 20 years (mean = 3.24, $P = .001$) of experience.

Preferred CE activities differed among respondents by educational background. A 1-way ANOVA revealed differences among respondents' educational backgrounds and their preference for research or poster presentations ($F_{2,405} = 13.881$, $P < .001$) and conducting scholarly research ($F_{2,406} = 9.524$, $P < .001$). Bonferroni pairwise comparisons demonstrated that respondents with a doctoral degree (mean = 3.64) preferred research presentations or posters more than did respondents with a bachelor's degree (mean = 2.83, $P < .001$) or master's degree (mean = 2.89, $P < .001$). Respondents with a doctoral degree

Table 1. Athletic Trainers' Preferred Type and Format of Continuing Education Activities

Type and Format of Continuing Education Activity	Mean ± SD[a]	Response, No. (%)				
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Clinical workshop (n = 423)	4.47 ± 0.714	3 (0.7)	4 (0.9)	25 (5.9)	150 (35.5)	241 (57.0)
Professional conference or seminar (n = 423)	4.26 ± 0.770	4 (0.9)	8 (1.9)	37 (8.7)	201 (47.5)	173 (40.9)
Small-group lecture (n = 422)	4.07 ± 0.794	3 (0.7)	12 (3.1)	12 (3.1)	218 (51.5)	127 (30.0)
Small-group discussion (n = 420)	3.91 ± 0.913	5 (1.2)	31 (7.4)	73 (17.4)	200 (47.6)	111 (26.4)
Professional networking (n = 417)	3.88 ± 0.850	2 (0.5)	18 (4.3)	113 (27.1)	180 (43.2)	104 (24.9)
Reading professional journals (n = 420)	3.79 ± 0.795	2 (0.5)	26 (6.1)	97 (23.1)	230 (54.8)	65 (15.5)
Home study course (n = 420)	3.66 ± 0.954	9 (2.1)	34 (8.1)	129 (30.7)	165 (39.3)	83 (19.8)
Mentoring a colleague (n = 416)	3.63 ± 0.826	3 (0.7)	20 (4.8)	170 (40.9)	159 (38.2)	64 (15.4)
Being mentored by a colleague (n = 418)	3.63 ± 0.931	8 (1.9)	23 (5.5)	169 (40.4)	133 (31.8)	85 (20.3)
Clinical case reports (n = 418)	3.61 ± 0.894	6 (1.4)	37 (8.9)	132 (31.6)	181 (43.3)	62 (14.8)
Large-group lecture (n = 422)	3.42 ± 0.983	13 (3.1)	68 (16.1)	114 (27.0)	182 (43.1)	45 (10.7)
Panel discussions (n = 423)	3.24 ± 0.952	3 (0.7)	4 (0.9)	25 (5.9)	150 (35.5)	241 (57.0)
Large-group discussion (n = 418)	3.14 ± 1.001	20 (4.8)	95 (22.7)	139 (33.3)	135 (32.3)	29 (6.8)
Conducting research (n = 415)	3.07 ± 1.018	30 (7.2)	78 (18.8)	176 (42.4)	97 (23.4)	34 (8.2)
Research presentation or poster (n = 413)	2.95 ± 0.896	21 (5.1)	93 (22.5)	204 (49.4)	75 (18.2)	20 (4.8)

[a] 1 = *Strongly disagree*, 5 = *strongly agree*.

(mean = 3.72) preferred conducting scholarly research more than did respondents with a bachelor's degree (mean = 2.92, $P < .001$) or master's degree (mean = 3.02, $P < .001$).

Respondents were requested to provide comments about additional preferred athletic training CE activities (Figure 1). Comments about additional formal CE activities were categorized into a single group and included various types of clinical learning activities (eg, serving as an Approved Clinical Instructor, attending sports medicine grand rounds with physicians, performing college coursework [emergency medical technician related]) and online CE (eg, participating in Webinars or online courses). Comments about additional preferred informal CE activities were categorized into 2 groups: (1) education-related activities, which described informal CE activities that were educational in nature (including teaching athletic training classes) and postprofessional fellowships and internships, and (2) networking opportunities, which described informal CE activities for professional networking and dialogues with colleagues.

Barriers to Athletic Training CE

The travel distance to CE (4.15 ± 0.958) and cost of attending CE (4.13 ± 0.994) were reported as the most prominent barriers to CE, whereas CE not meeting educational needs (2.62 ± 1.102) and lack of self-confidence in learning material presented (1.82 ± 0.852) were reported as the least prominent barriers to CE (Table 2).

A repeated-measures ANOVA revealed differences among the barriers to ATs' CE participation ($F_{10,411} = 233.54$, $P < .001$). Bonferroni pairwise comparisons indicated that the means for each of the barriers to athletic training CE were different. The travel distance to the CE activity (mean = 4.15) and cost of attending the CE activity (mean = 4.13) were considered to be greater barriers than the other barriers, but they did not differ from each other.

Barriers to athletic training CE differed by the sex of the respondent. A 1-way ANOVA showed that women ($F_{1,420} = 21.480$, $P < .001$) reported that the cost of attending CE activities was a barrier more than did men. Interestingly, men reported "not interested in being taken away from my personal/family responsibilities" ($F_{1,416} = 10.878$, $P = .001$) as a barrier to CE more than did women.

Barriers to athletic training CE differed among respondents from different practice settings. A 1-way ANOVA identified differences among the practice setting of the respondent and the cost of attending the CE activity ($F_{9,377} = 2.932$, $P = .002$). Bonferroni pairwise comparisons revealed that respondents from professional sport settings (mean = 3.07) less often reported the cost of attending as a barrier to CE than did respondents from the college or university (mean = 4.07, $P = .013$), high school (mean = 4.19, $P = .003$), sports medicine clinic (mean = 4.25, $P = .003$), health or fitness center (mean = 4.50, $P = .044$), hospital (mean = 4.21, $P = .024$), corporate or industrial (mean = 4.46, $P = .045$), or other (mean = 4.47, $P = .011$) setting.

Barriers to athletic training CE differed among respondents with different amounts of money allocated for CE. A 1-way ANOVA demonstrated differences among the amount of money allocated for CE and other barriers, such as the cost of attending the CE activity ($F_{6,390} = 10.455$, $P < .001$), travel distance to the

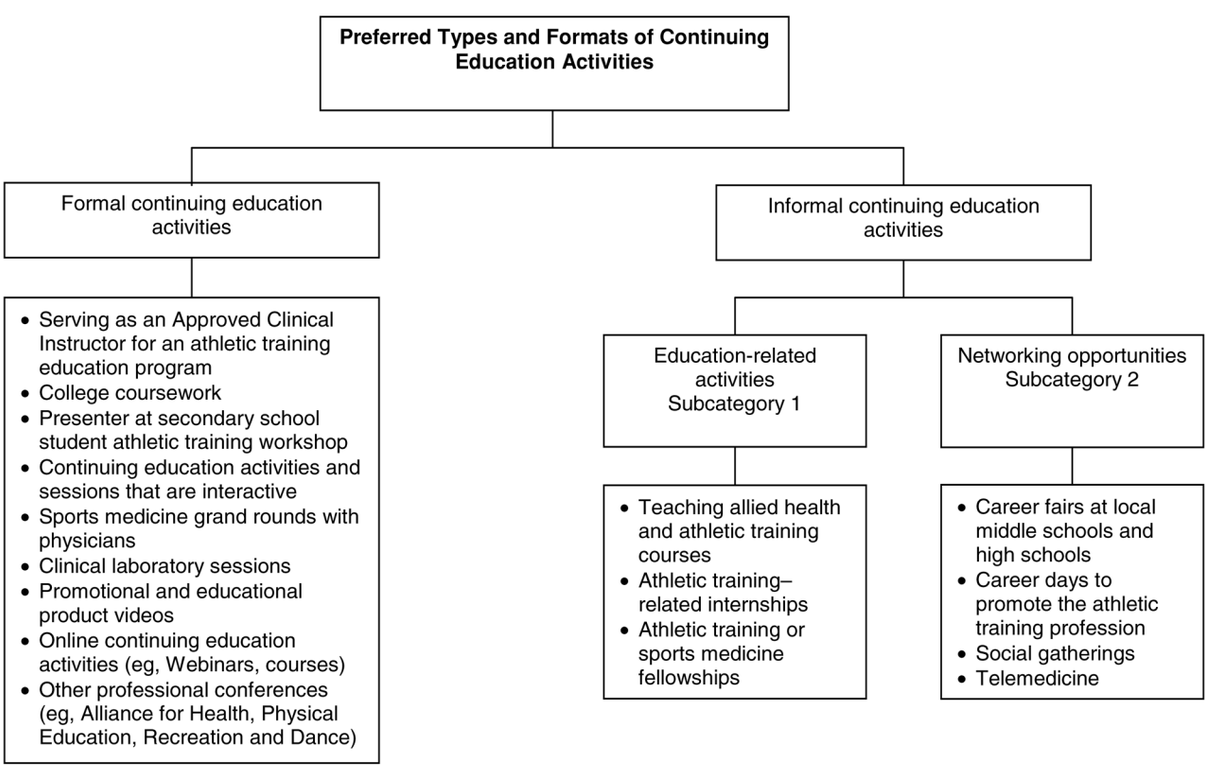

Figure 1. Conceptual framework of qualitative data: athletic trainers' preferred types and formats of continuing education activities.

Table 2. Barriers to Athletic Training Continuing Education (CE) Activities

Barriers to Athletic Training CE	Mean ± SD[a]	Response, No. (%)				
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Distance of travel (n = 421)	4.15 ± 0.958	7 (1.7)	32 (7.6)	28 (6.7)	178 (42.3)	176 (41.8)
Cost of attending (n = 422)	4.13 ± 0.994	8 (1.9)	35 (8.3)	30 (7.1)	172 (40.8)	177 (41.9)
Lack of financial support from employer (n = 420)	3.70 ± 1.294	27 (6.4)	67 (16.0)	68 (16.2)	99 (23.6)	159 (37.9)
Lack of staff to cover patient care (n = 420)	3.68 ± 1.199	19 (4.5)	63 (15.0)	88 (21.0)	115 (27.4)	135 (32.1)
Lack of time to commit to CE activity (n = 419)	3.53 ± 1.090	18 (4.3)	63 (15.0)	98 (23.4)	161 (38.4)	79 (18.9)
Lack of relevant sessions at CE activity (n = 419)	2.96 ± 1.122	37 (8.9)	127 (30.3)	105 (25.1)	116 (27.7)	34 (8.1)
Lack of quality sessions at CE activity (n = 417)	2.89 ± 1.100	38 (9.1)	130 (31.2)	119 (28.5)	98 (23.5)	32 (7.7)
Lack of interest in the CE type or format (n = 418)	2.76 ± 1.066	50 (12.0)	130 (31.1)	127 (30.4)	92 (22.0)	19 (4.5)
Not interested in taking time away from family or personal time (n = 418)	2.65 ± 1.150	67 (16.0)	140 (33.5)	111 (26.6)	72 (17.2)	28 (6.7)
Activity does not meet educational needs (n = 418)	2.62 ± 1.102	64 (15.3)	145 (34.7)	117 (28.0)	68 (16.3)	24 (5.7)
Lack of self-confidence in learning the material presented (n = 417)	1.82 ± 0.852	173 (41.5)	167 (40.0)	60 (14.4)	14 (3.4)	3 (0.7)

[a] 1 = *Strongly disagree*, 5 = *strongly agree*.

CE activity ($F_{6,389} = 4.391$, $P < .001$), lack of financial support from employer ($F_{6,389} = 22.877$, $P < .001$), lack of available staff to cover patient care responsibilities during CE ($F_{6,388} = 3.596$, $P = .002$), and not interested in taking time away from personal or family responsibilities ($F_{6,386} = 3.491$, $P = .002$).

Bonferroni pairwise comparisons showed that respondents who received more than $1000 for CE participation (mean = 3.43) reported the cost of the CE activity ($P = .002$) and lack of financial support from employer ($P = .016$) as barriers to CE less often than did all other respondents. Respondents receiving more than $1000 (mean = 3.72) reported the travel distance to the CE activity as a barrier less often than did respondents who received no money for CE participation (mean = 4.38, $P < .001$), those who received less than $250 (mean = 4.27, $P = .012$), and those with unspecified or unlimited amounts for CE (mean = 4.46, $P = .033$).

A 1-way ANOVA identified no difference in barriers to athletic training CE among the 10 NATA districts ($F_{9,390}$ range = 0.295 to 1.574, $P > .05$). In addition, a 1-way ANOVA displayed no differences among respondents' total years of athletic training experience ($F_{4,397}$ range, 0.469–2.273, $P > .05$), years of experience in the current practice setting ($F_{9,362}$ range, 0.322–2.043, $P > .05$), current position in the practice setting ($F_{5,332}$ range, 0.806–2.045, $P > .05$), or educational background ($F_{2,409}$ range, 0.373–2.766, $P > .05$) and barriers to athletic training CE.

Respondents provided comments about additional barriers to formal and informal athletic training CE activities (Figure 2). Comments about additional barriers to formal CE were categorized as personal barriers (3 subcategories) or setting-specific barriers (2 subcategories). Personal barriers included the subcategories of lack of time to commit to CE activities, conflicting family responsibilities, and lack of interest or support and described unique personal barriers to participating in formal and informal CE. Setting-specific barriers included the subcategories of lack of financial support from employer and conflicting job responsibilities and described how the practice setting was a barrier to participation in formal and informal CE activities.

DISCUSSION

Preferred Athletic Training CE Activities

For the most part, respondents in this investigation preferred formal CE over informal CE activities. Similar research in medicine,[13,16,31] nursing,[10,15] dietetics,[11] physical therapy,[12] occupational therapy,[5] veterinary medicine,[32] library science,[33] and social work[7] also demonstrated that formal CE activities were preferred over informal CE. Respondents' comments on additional formal CE activities indicated that they prefer hands-on activities. Researchers in medicine[16] and nursing[10] have also documented a preference for hands-on CE activities. Experiential learning techniques and practical application exercises (eg, patient simulation, role playing) preferred in adult learning allow the demonstration and reinforcement of new knowledge and skills.[34]

Respondents preferred formal online CE activities, probably because busy ATs can complete online CE as their schedules allow. Similar research in medicine,[31] nursing,[10,14] physical therapy,[12] and dietetics[35] has indicated that professionals in these fields also have a preference for online CE activities. Interestingly, formal online CE activities can also provide professionals with valuable informal CE opportunities as they collaborate, share literature, engage in group discussions, and interact through electronic means.[6]

Among our respondents, professional networking and reading professional journals were the preferred informal CE activities. Similar research in medicine,[16] nursing,[14,36] and dietetics[11] has shown that practitioners in these fields also prefer these informal CE activities. Informal CE is often preferred over formal CE because practitioners can meet their learning needs in an individualized manner.[6]

Of the additional preferred informal CE activities noted by the respondents, activities such as teaching athletic training classes and pursuing postprofessional clinical experiences (eg, fellowships) were thought to be valuable. Respondents reported that networking also seems to provide important learning opportunities that do not fit within the traditional realm of formal

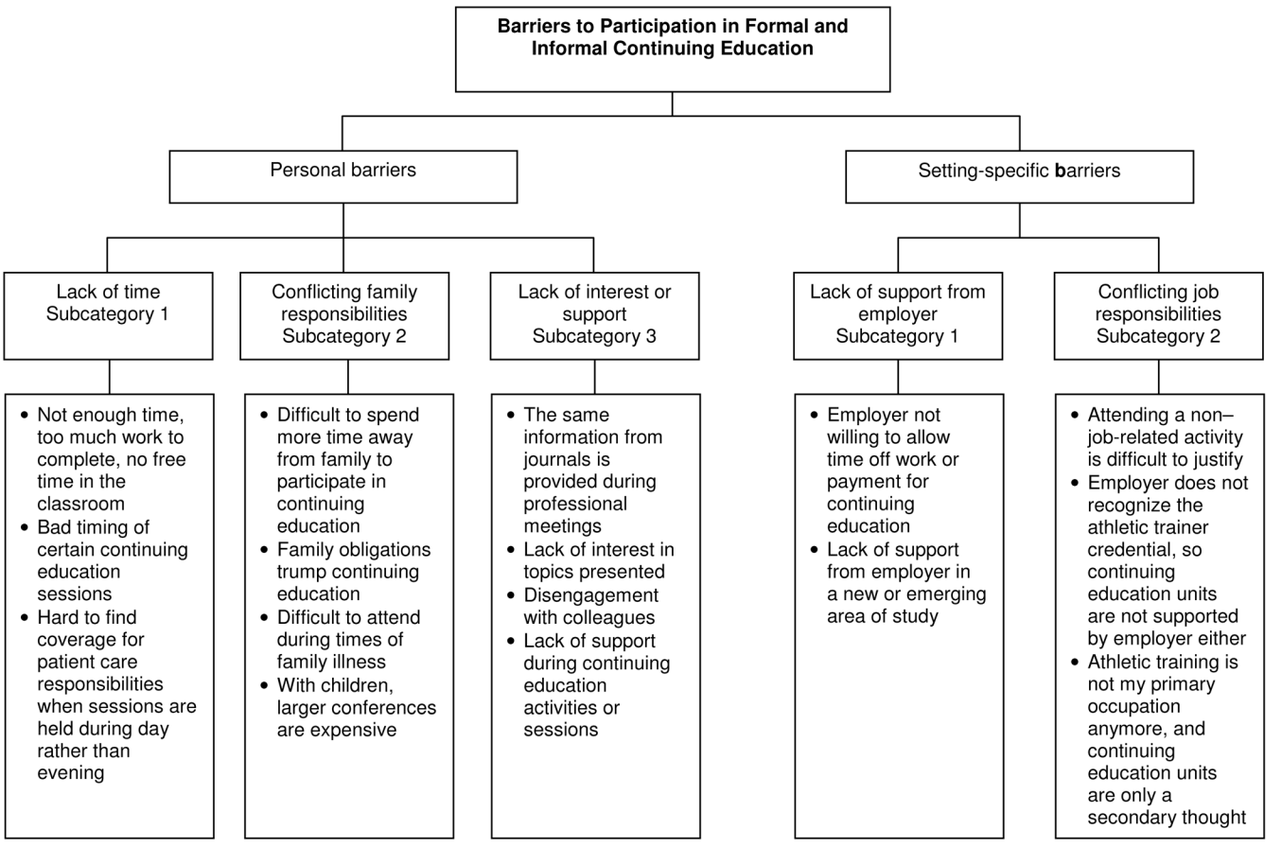

Figure 2. Conceptual framework of qualitative data: athletic trainers' barriers to participation in formal and informal continuing education activities.

CE. Certainly, networking is very flexible and is a hallmark characteristic of informal CE.[12] In our previous investigation,[4] we reported important benefits of informal CE activities for improving professional practice. Research to examine means of providing CE credit for informal CE activities is certainly warranted.

Several demographic characteristics of the respondents seemed to influence their preferred CE activities, suggesting a continuum of learning that occurs throughout a practitioner's professional life.[2] Men reported a preference for small-group discussion more than did women, indicating that men preferred CE activities with smaller numbers of attendees than did women. Experienced ATs (those with more than 20 years' experience) preferred professional conferences or seminars and panel discussions, whereas less experienced ATs (those with 1–5 years' experience) preferred being mentored. This finding is important because it indicates that the practitioners' learning needs and preferences for CE changed over the course of their professional practices. It seems prudent, then, that the learning needs and associated preferred CE activities of novice to expert practitioners should be examined.

The practice setting of the AT also influenced the preferred CE activities. Respondents from the college or university setting (ie, academic faculty) preferred formal CE such as presenting case studies and conducting scholarly research more than did respondents from other practice settings. This is probably the case because they perform less patient care and have more job expectations related to teaching, scholarship, and service. In addition, college and university settings typically provide more resources for scholarly research than do other settings. The educational background of these respondents (ie, doctoral degree) was also logically linked to these activities.

Barriers to Athletic Training CE Activities

Barriers to formal athletic training CE do not appear to be affected by NATA district. However, barriers differed among respondents with different years of experience, practice settings, and so on. Interestingly, male ATs more often reported that they were not interested in taking time away from personal or family responsibilities. This finding is supported by the results of Mazerolle et al,[37] who reported that both male and female ATs experienced work–family conflict. Furthermore, women in our study reported that the cost of the CE activity and the travel distance to the CE activity were barriers more often than did men. This finding is consistent with that of Hughes,[38] insofar as women preferred the lower cost of CE activities that involved less travel. Similar research in nursing,[20–23,25,26] physical therapy,[12] and occupational therapy[5,24] described the travel distance to CE and the cost of attending CE as the 2 most prominent barriers to participating in formal CE. Thus, excessive costs associated with formal CE activities and excessive travel distance are not unique to athletic training but also exist in other allied health professions.

Respondents in our investigation also reported that a lack of financial support from the employer and a lack of available staff

to cover patient-care responsibilities while completing formal CE were barriers. These findings are consistent with research from nursing[6,12,20–22,25,26,28] and medicine.[27] This result suggests that ATs try to choose formal CE activities that are cost effective, require fewer days of missed work, and can be completed in one's own practice setting or close to home.

Interestingly, respondents less often reported that a lack of self-confidence regarding learning material (1.82 ± 0.852) and not being interested in taking time away from personal or family responsibilities (2.65 ± 1.150) were barriers to participating in formal CE. In contrast, researchers in medicine[15] and nursing[6,24] showed that both a lack of self-confidence and time away from family were often reported as major barriers. The uniqueness of these professions may explain the different perceptions regarding these barriers to formal CE; each profession requires unique knowledge and skills. Athletic trainers may have viewed these perceived barriers as less cumbersome than did other health care professionals.

The practice setting of the AT also offered specific barriers to formal CE participation with regard to cost. Athletic trainers practicing in the professional sport setting reported the cost of attending formal CE as a barrier less often than did respondents from other practice settings. Therefore, ATs in other settings (eg, high school, sports medicine clinic) may have to be more concerned with the total cost of the formal CE activities. Logically, ATs in these settings reported that they preferred CE activities that involve less cost, less travel, and less time away from patient-care responsibilities.

Given the importance of cost, it is not surprising that the amount of money allocated for CE was related to other barriers. The more money allocated, the less likely the cost of CE and travel distance were to be reported as barriers to participating in formal CE. Interestingly, ATs receiving less than $250 for CE participation more often reported a lack of staff to cover patient care responsibilities, a lack of time to commit to CE participation, and not being interested in taking time from personal or family responsibilities as barriers to formal CE. Lack of support from an employer and excessive cost of CE were also identified as barriers to formal CE in physical therapy,[12] nursing,[20,22–26,28] and adult education.[11,39] This finding is important because ATs who receive less money for CE participation will need to find low-cost alternatives that involve less travel and less time away from patient-care responsibilities.

Other than the present research, we found no literature to date that addresses barriers to informal CE. As noted by the respondents' comments in Figure 2, time constraints (eg, timing of CE activity relative to scheduled athletic events or evening, weekend, or holiday schedules) and conflicts with family responsibilities (eg, family illnesses) were frequently reported as barriers to formal and informal CE participation

CONCLUSIONS AND IMPLICATIONS

We are the first to examine ATs' preference for CE activities and specific barriers that prevent CE participation. Formal CE activities were most often preferred, particularly hands-on workshops. Formal online CE activities were also preferred; these simultaneously provide some preferred informal CE activities, such as collaboration, group discussions, and professional networking, as the participants interact through electronic means. The informal CE activities most preferred by ATs were networking and reading professional journals, so online learning appears to be an important direction for future athletic training CE. Additional informal CE activities, such as teaching athletic training classes and pursuing postprofessional clinical experiences (eg, fellowships), were thought to be valuable and should warrant CE attention. Given that ATs in the college and university academic setting (ie, athletic training faculty) prefer formal CE activities such as presenting case studies and conducting scholarly research, continuing efforts to connect scholarly information with clinical practitioners is important. The same barriers to formal CE appear to be universal to most ATs (ie, the cost of attending the CE activity and the travel distance for the CE activity); however, some difference did exist related to sex, clinical practice setting, and years of experience as an AT. Providers of CE need to be aware that male ATs reported more often than did female ATs that they were not interested in taking time away from personal or family responsibilities to complete CE activities.

Athletic training CE activities serve as the cornerstone of professional and public accountability. To fulfill his or her professional responsibility, each practitioner must understand and control his or her own learning experiences through CE activities that are appropriate for the particular practice setting.[2] Because the ultimate goal of CE is to improve patient care, ATs must look to CE to facilitate the acquisition and retention of knowledge and skills that are relevant to their work.[34] Therefore, ATs must understand not only their learning needs but also their preference for CE and the associated barriers that prevent full participation. Similarly, it is important that CE providers make available CE opportunities that are versatile and realistic.

The preferences for many informal CE activities displayed by our respondents warrant further research to better understand why they are preferred over formal CE activities. Our previous research[4] indicated that informal CE is considered beneficial. Therefore, means for awarding CE credit for informal CE activities should be explored. In addition, future researchers should examine the barriers to application of new knowledge and skills into clinical practice. It is likely that there are other barriers specific to applying new knowledge and skills learned during CE activities into clinical practice. Lastly, the suggestion that learning needs and preferences change over the development from novice to expert practitioner should also be investigated further. One viable outcome may be that more and less experienced ATs are paired together and engage in a structured mentor program, for which both groups earn CE credit.

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