

# Educational Preparation for the Clinic Job Setting: Clinical Athletic Trainers' Perspectives

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**Context:** Acquiring input from all stakeholders on the importance of existing competencies and suggestions for new ones is essential to competency-based pedagogical design quality.

**Objective:** To survey athletic trainers (ATs) employed in clinical settings to assess their perceptions of the competencies most pertinent to their settings and whether additional specific competencies are necessary.

**Design:** Survey.

**Setting:** Clinic Job Setting.

**Participants:** A total of 554 ATs listed under the Clinic Job Setting category.

**Main Outcome Measures:** The level of importance clinical ATs assign to competencies in the *Athletic Training Educational Competencies* document (4th edition) that pertain most to clinical settings, the relationship between demographic factors and the importance level clinical ATs assign to these competencies, and additional competencies suggested by clinical ATs were measured. The importance of competencies was rated on a 4-point Likert type scale ranging from not important (1) to very important (4).

**Results:** The average ratings of level of importance from all the competencies surveyed ranged from 2.50 to 3.87, with an overall mean of 3.27. The demographic data demonstrated significant differences in perceived importance of specific competencies between groups within factors, including gender, age, highest degree, years as a AT, years in a clinical setting, clinical practice settings, and percentage of total working hours spent within the clinic. Additional competencies related to communication and documentation skills were recommended most frequently.

**Conclusion:** Although not of equal importance, arguably, all the competencies included in this study are needed in athletic training education programs to prepare students for careers in clinical settings

**Key Words:** competency, rating, web-based survey

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**A**thletic training educational reform incorporates an accredited competency-based education (CBE) model to ensure program quality and accountability for stakeholders, which ultimately results in state regulation of the profession, preferably in the form of licensure.<sup>1</sup>

Teaching faculty and clinic-based practicing athletic trainers perceive content areas<sup>2</sup> and the importance of specific competencies<sup>3</sup> differently. Coll and Zegwaard<sup>4</sup> argue that an understanding of all education stakeholders' views is an essential prerequisite for competency-based pedagogical design quality. All too often, the decision as to which competencies to include in CBE programs are made by only a few individuals.<sup>5</sup> When a variety of stakeholders participate in curriculum decisions, it is possible to reach greater understanding of others' experiences and the relevance to curricular design.<sup>6</sup> Not only do differences occur between stakeholders, but an investigation of physical therapy clinicians employed in various practice settings reveals that the perceived importance of competencies differed with job setting as well.<sup>7</sup> CBE program competencies need to be accurately linked to the duties employees actually perform.<sup>8</sup> For example, musculoskeletal ultrasonography professionals recently worked together to develop competency standards consensus within an evidence-based educational framework, with the hope that ownership by practicing parties would increase the likelihood of an acceptable outcome.<sup>9</sup> If professional competencies are to guide educational program content decisions, it is important that all stakeholders have a voice, including: employers, patients, educators, and possibly most importantly, the actual practitioners of a particular discipline.

The 4<sup>th</sup> edition of the National Athletic Trainers' Association's *Athletic Training Educational Competencies* articulated 12 content areas of professional competencies for athletic trainers (ATs).<sup>10</sup> This edition was developed with the assistance of members of the Entry-Level Education Committee. The process included a survey created by the National Athletic Trainers' Association (NATA) that was available to all NATA members asking them to provide feedback on the addition, modification, or deletion of competencies or clinical proficiencies. This survey resulted in 48 forms being submitted (personal communication, Dan Sedory, Entry-Level Education Committee Chair, April 8, 2006). The Role Delineation Study developed in 2004 reflects knowledge and skills necessary for competence as entry-level ATs as perceived by AT practitioners in all settings.<sup>11</sup> This study serves as a template for the certification exam students must successfully pass to complete the athletic training credential.<sup>10</sup> The study asked a panel of 20 experts to identify task domains (6) representative of knowledge and skills essential to athletic training; these were validated by surveying ATs from multiple settings who rated the 6 domains and tasks only, not individual competencies.<sup>11</sup> The Entry-Level Education Committee considered the results from this study when developing the competencies listed in the *Athletic*

*Training Educational Competencies* (4<sup>th</sup> edition) document which includes 12 content areas.<sup>10</sup> Because these two documents were created by two separate entities for distinct, unrelated purposes, the practitioners in specific practice settings may only have had indirect input into the competencies. Because the viewpoints of practitioners who actually perform the duties required of a specific profession in particular settings would provide relevant input on competencies needed for the profession, the purpose of the present study was to determine if specific clinical setting cognitive and psychomotor competencies were perceived as important by clinical setting practitioners in the United States. To this end, those in the largest NATA membership category (clinical setting; 27.74%)<sup>12</sup> were surveyed to assess the perceived importance of the existing competencies and identify potential additional competencies needed by entry-level ATs employed in the clinical settings.

## METHODS

### Participants

NATA membership statistics divides the clinical setting into five sub-categories: Hospital-Based Clinic, Outpatient-Ambulatory-Rehabilitation Clinic, Physician Owned Clinic, Secondary School Clinic, and Other Clinic. All NATA members who indicated practicing in the clinical setting<sup>12</sup> in the United States were surveyed via email. Of a possible 7,031 potential subjects, only 3,693 received the survey. The remaining members either chose to block survey participation as a membership option or had spam filters on their computers preventing them from receiving the survey. The demographic data is presented in Table 1.

### Instrumentation

A web-based survey using SurveyMonkey (2007 SurveyMonkey.com) was created for participant convenience, fast response times, and cost effectiveness. While the entire 4<sup>th</sup> edition of the *Athletic Training Educational Competencies* document consists of 257 competencies (202 cognitive and 55 psychomotor) and 12 clinical proficiencies,<sup>10</sup> the competencies rated in this study were derived from 5 content areas in the document deemed most relevant to the clinical setting: 1) Orthopedic Clinical Examination and Diagnosis; 2) Therapeutic Modalities; 3) Conditioning and Rehabilitative Exercise; 4) Psychosocial Intervention and Referral; and 5) Health Care Administration.<sup>10</sup> Some competencies were combined to avoid redundancy, and others, which suggested separate competencies, were divided to maintain instrument accuracy while improving clarity and preserving the intent of the competencies. Because these content areas are based on the cognitive and psychomotor competencies, and to respect the length of the survey, they were not included. The content areas not used in this research included: 1) Risk Management and Injury Prevention; 2) Pathology of Injuries and Illnesses; 3) Medical

**Table 1.** Demographic Response Totals (n = 554)

Demographic Response	%	n
<b>Gender:</b>		
Male	51.6	286
Female	48.4	268
<b>Age (years):</b>		
21-30	40.6	225
31-40	37.0	205
41-50	16.6	92
51-60	5.4	30
61+	0.4	2
<b>Highest Degree:</b>		
Bachelors	39.2	217
Masters	56.0	310
Doctorate	4.8	27
<b>Years as an Athletic Trainer:</b>		
0-5	31.4	174
6-10	25.4	141
11-15	18.8	104
16-20	14.1	78
21+	10.3	57
<b>Years in a Clinical Setting:</b>		
0-5	44.4	246
6-10	22.2	123
11-15	19.0	105
16-20	10.6	59
21+	3.8	21
<b>Current Clinical Practice Setting:</b>		
Hospital-Based Clinic	12.8	71
Outpatient-Ambulatory-Rehab Clinic	28.3	157
Physician Owned Clinic	15.0	83
Secondary School Clinic	40.4	224
Other Clinic	3.4	19
<b>Percentage of Total Working Hours Spent Within Clinic:</b>		
0-25%	25.3	140
26-50%	22.0	122
51-75%	11.7	65
76-100%	41.0	227
<b>Educational Route to Certification:</b>		
Accredited Curriculum Program	56.5	313
Internship Route	43.5	241
<b>State Regulation:</b>		
Licensure	72.4	401
Certification	14.3	79
Registration	3.6	20
No Regulation	6.1	34
Exemption	3.6	20

Conditions and Disabilities; 4) Acute Care of Injuries and Illnesses; 5) Nutritional Aspects of Injuries and Illnesses; 6) Pharmacology; and 7) Professional Development and Responsibility. It was determined by the authors and 3 clinical experts that the competencies contained in these content areas did not best

represent the knowledge and skills needed most by an entry-level AT employed in a clinical setting.

The questionnaire consisted of: 1) 99 competencies (69 cognitive and 30 psychomotor) rated on a four-point Likert type scale (not important, somewhat important, important, and very important); 2) open-ended questions asking for additional competencies perceived as needed by entry-level ATs in a clinical setting; and 3) demographic information. The participants were asked to rate each competency in the particular content area by perceived importance to an entry-level AT employed in a clinical setting. After the list of competencies for each content area was an open-ended question asking for additional recommended competencies. Demographic information included: gender, age, years as a AT, clinical practice settings, educational level, years of experience in the clinical setting, percentage of working hours within the clinic, and route to certification.

The instrument was reviewed online by three clinical and three educational experts for face and content validity. Their expert status was determined by the fact they all had a minimum of 10 years experience in the clinical and educational settings respectively. The clinical experts were asked to verify that the competencies included best represented the knowledge and skills required of a novice AT in a clinical setting. The educational experts were asked to judge whether the survey retained the intent of the NATA competencies listed in the five content areas selected for this study.

The instrument was pilot tested with a sample of 30 Hospital-Orthopedic ATs chosen randomly through the NATA membership services to obtain feedback on questionnaire clarity, length, and technical issues. These subjects were chosen due to the similarity the setting has with the majority of clinical job settings. The data from the pilot study was not included in the final results. The time to complete the survey was estimated to be approximately 20 minutes. No further changes were made as a result of the pilot study.

### Procedures

The institutional review board granted approval for this project prior to data collection. An email distribution list and customized invitation message were created, with the survey distributed through the web-based software in December of 2007. Two follow-up emails with survey links were sent to non-responders at 1 week intervals following the initial distribution. All responses collected were saved anonymously.

### Data Analysis

The quantitative data was analyzed using Statistical Package for the Social Sciences software (version 16.0; SPSS Inc, Chicago, IL). A one-way analysis of variance (ANOVA) provided average ratings of levels of importance for each competency or questionnaire item of the survey and compared mean ratings of the demographic group data using an alpha level of .01. Tukey post hoc analysis using an alpha level of .01 was used to determine if a significant

difference existed between groups within demographic factors, including: age, years as a AT, clinical practice settings, education level, years of experience in the clinical setting, and percentage of working hours within the clinic.

The first author of this study contributed the qualitative data analysis. An inductive content analysis strategy where data was organized around common themes was used to establish categories from the recommended additional competencies. For example, responses such as, “to be able to speak professionally regarding the findings and treatment plan,” “patient education,” and “ability to effectively communicate the necessary information to people of all education levels” would be placed under the category of communication skills.

## RESULTS

There were a total of 3,693 surveys distributed to the certified NATA members listed under the clinic job setting category. There were 554 surveys returned resulting in a 15% response rate.

### Competency Importance Level Ratings

The average ratings of level of importance from all the competencies surveyed ranged from 2.50 to 3.87, with an overall mean of 3.27 on a 4-point Likert scale (see Table 2). The highest ratings of perceived importance came from competencies listed in three content areas, including: Conditioning and Rehabilitation Exercise, Orthopedic Clinical Examination and Diagnosis, and Therapeutic Modalities. The lowest importance ratings came from competencies in the Psychosocial Intervention and Referral and Health Care Administration content areas.

### Demographic Factors

#### Gender

The demographic response totals are represented in table form (see Table 1). The competency statement codes and the content areas under which they are listed can be found in Table 3. The female respondents perceived seven competencies as greater in importance than the male participants. These competencies included knowledge in the areas of conducting and interpreting medical documentation, selection of proper therapeutic exercises, health care education, patient referral, management of chronic

pain patients, and inspection of exercise equipment to ensure its safety.

#### Highest Degree

The respondents holding master's degrees perceived competencies involved with knowing human body systems ( $F_2 = 5.65, P = .004$ ) of greater importance than perceived by respondents holding bachelor's degrees. The respondents holding master's degrees also perceived competencies involved with understanding further diagnostic tests in the way of imaging techniques ( $F_2 = 6.58, P = .002$ ) of greater importance than perceived by respondents holding bachelor degrees (see Table 4).

#### Educational Route

Prior to 2004, athletic training students could pursue an internship or curriculum route to certification. There were no significant differences in perceived competency importance between ATs graduating from an athletic training curriculum program and those who completed the internship route to certification.

#### Age and Years Experience

Older respondents ( $F_3 = 9.25, P = .000; F_3 = 4.88, P = .002$ ), those with more years of experience as ATs ( $F_3 = 10.15, P = .000; F_3 = 5.95, P = .001; F_3 = 5.10, P = .002$ ), and those with more experience in clinical practice settings ( $F_3 = 8.41, P = .000; F_3 = 4.11, P = .007; F_3 = 4.39, P = .005$ ) perceived competencies that required knowledge pertaining to the scientific principles behind passive and active therapeutic modalities along with the skills to measure joint range of motion using specific instruments as more important than younger, less experienced respondents (see Table 5, 6, and 7). The younger, less experienced practitioners perceived the knowledge involved in budgeting, inventory, and pre-participation physicals as more important than the older participants with more experience ( $F_3 = 4.67, P = .003; F_3 = 4.47, P = .004; F_3 = 4.34, P = .005$ ) (see Table 5, 6, and 7). The participants with more experience showed a decrease in employment in Secondary School Clinic settings and an increase in the percentage of hours worked in the clinic.

#### Clinical Practice Setting

Respondents employed in Outpatient-Ambulatory-Rehabilitation clinics perceived the importance of knowledge in the healing

**Table 2.** Importance Level Ratings

Content Area	Competency Importance Level Rating Average Range	Content Area Importance Level Rating Grand Mean
Orthopedic Clinical Examination and Diagnosis	3.24-3.87	3.59
Therapeutic Modalities	2.67-3.70	3.34
Conditioning and Rehabilitation Exercise	3.28-3.81	3.61
Psychosocial Interention and Referral	2.72-3.16	2.94
Health Care Administration	2.50-3.63	2.99

Note: 1 = not important, 2 = somewhat important, 3 = important, and 4 = very important

**Table 3.** Content Areas and Competency Statement Coding

Content Area	Cognitive	Psychomotor
Orthopedic Clinical Examination and Diagnosis	Q1A, Q1F, Q1H, Q1J	Q2D
Therapeutic Modalities	Q4A, Q4B, Q4C, Q4H	Q5B
Conditioning and Rehabilitation Exercise	Q7B, Q7H, Q7K	Q8B
Health Care Administration	Q12A, Q12I, Q12K, Q12L	N/A

**Table 4.** Group Differences Using Post Hoc Analysis - Degree

Competency Statement	Between Groups Comparisons	Standard Error	P
(Q1A) Know the systems of the human body	Bachelor's x Master's	.050	.003*
	Bachelor's x Doctorate	.116	.309
	Master's x Doctorate	.114	.999
(Q1H) Know the use of diagnostic tests and imaging techniques for injury assessment	Bachelor's x Master's	.061	.002*
	Bachelor's x Doctorate	.142	.072
	Master's x Doctorate	.139	.730

\* Statistically significant finding ( $P < .01$ )

process as it pertained to the selection of therapeutic modalities ( $F_4 = 4.25, P = .002$ ) and skills with instruments that measure joint range of motion ( $F_4 = 7.16, P = .000$ ) as greater in importance than respondents employed in Secondary School Clinics. They also perceived the budgeting process as more important than the respondents employed in physician-owned clinics ( $F_4 = 4.16, P .003$ ) (see Table 8). On the other hand, participants employed in Physician Owned Clinics perceived the importance of knowledge in third-party reimbursement strategy ( $F_4 = 4.43, P = .002$ ) as greater in importance than respondents employed in Secondary School Clinics (see Table 8).

#### Percentage of Total Hours within Clinic

The respondents with the greatest percentage of their working hours spent in the clinic perceived knowledge of movement terminology ( $F_3 = 4.24, P = .006$ ), medical documentation ( $F_3 = 5.24, P = .001$ ), skills with specific instruments to measure joint range of motion ( $F_3 = 6.98, P = .000$ ), and interpretation of measurements to evaluate the progression of therapeutic exercise as greater in importance than practitioners with less time spent within the clinic (see Table 9).

#### Additional Competencies Recommended

Additional competencies or themes suggested by the participants of this study were grouped into categories using competency headings. Given the way the data was reported by SurveyMonkey it was not possible to determine the total number of participants who recommended additional competencies, as some individuals offered multiple suggestions. From the 130 total competencies or themes suggested by respondents, 38 categories were established. Categories that contained a minimum of eight common themes were included in the results. This refinement

resulted in six categories, including: communication skills, documentation skills, functional assessment, bracing-splinting-casting skills, manual therapy skills, and knowledge of illnesses (see Table 10). The communication and documentation skill categories represented 16% and 13% of the total suggested additional themes, respectively. Each of the other four categories represented approximately 6 to 8 percent of the total number of additional themes suggested.

## DISCUSSION

The primary goal of this research was to assess the perceived importance of existing competencies listed in the *Athletic Training Educational Competencies* document (4<sup>th</sup> edition) that were most relevant to clinical settings. This study also sought to identify potential gaps between the required competencies and the knowledge and skills necessary to work in the clinical setting.

Research investigating competency importance within athletic training education programs is limited. Two studies considered importance level ratings of content areas. The first study examined differences in the importance of 12 content areas included in the 3<sup>rd</sup> edition of educational competencies as perceived by faculty (42), and ATs (183) employed in clinic, high school, and clinic-high school settings.<sup>2</sup> The results found differences between groups in several content areas, including: Pharmacology, Acute Care of injury and Illness, Therapeutic Modalities, Therapeutic Exercise, and Health Care Administration. A second study exploring the importance levels of content areas included in the 2<sup>nd</sup> edition of educational competencies asked clinical directors (127) which areas were of greatest importance for ATs employed in clinical settings.<sup>13</sup> Those findings suggested that the areas of prevention, evaluation, and rehabilitation of athletic injuries were of greatest importance as perceived by clinical directors. This previous



**Table 5.** Group Differences Using Post Hoc Analysis - Age

Competency Statement	Between Groups Comparisons (years)	Standard Error	P
(Q4B) Know the principles of physics and basic concepts associated with the electromagnetic spectra	(21-30) x (31-40)	.078	.004*
	(21-30) x (41-50)	.100	.036
	(21-30) x (51+)	.152	.000*
	(31-40) x (41-50)	.101	1.000
	(31-40) x (51+)	.153	.027
	(41-50) x (51+)	.165	.050
(Q4H) Know the electrophysics, physical properties, and biophysics associated with commonly used therapeutic modalities	(21-30) x (31-40)	.077	.515
	(21-30) x (41-50)	.099	.879
	(21-30) x (51+)	.152	.001*
	(31-40) x (41-50)	.101	.988
	(31-40) x (51+)	.153	.012
	(41-50) x (51+)	.165	.013
(Q7B) Know the mechanical principles applied to the design and use of therapeutic exercise equipment and techniques (leverage, force, kinesiology, and biomechanics)	(21-30) x (31-40)	.062	.016
	(21-30) x (41-50)	.080	.271
	(21-30) x (51+)	.122	.007*
	(31-40) x (41-50)	.081	.956
	(31-40) x (51+)	.123	.325
	(41-50) x (51+)	.133	.235
(Q12L) Explain components of the budgeting process, including purchasing, requisition, bidding, and inventory	(21-30) x (31-40)	.087	.501
	(21-30) x (41-50)	.111	.082
	(21-30) x (51+)	.170	.006*
	(31-40) x (41-50)	.113	.582
	(31-40) x (51+)	.171	.053
	(41-50) x (51+)	.184	.384

\* Statistically significant finding ( $P < .01$ )

research lends credibility to the current study's choice of content areas as being relevant to clinical settings.

Three other studies considered importance ratings of competencies within the content areas. The first study asked a group of 809 ATs employed in all job settings and a group of sports medicine physicians (122) their perception of the importance of the competencies listed under the General Medical Conditions and Disabilities content area of the 3<sup>rd</sup> edition competency document.<sup>14</sup> The results from this investigation suggested some of the competencies within this content area were considered relatively unimportant for entry-level ATs. A second study asked program directors (64) to rank the competencies listed under each of 7 content areas included in the 1<sup>st</sup> edition of educational competencies.<sup>15</sup> The findings from this research demonstrated the preferred sequence of competencies expressed by the athletic training program directors did not differ significantly from a random chance. The last study surveyed program directors (50), clinical instructors (71), and a random sample of ATs (179)

to assess the perceived level of importance placed on all 175 competencies grouped in the seven content areas provided by the 1<sup>st</sup> edition of educational competencies.<sup>3</sup> The results of this research demonstrated that twelve of the 175 competencies exhibited differences between groups. Even though several demographic groups in this study demonstrated importance differences between competencies, the data from the current research indicated all the competencies included in this survey could arguably remain in the curriculum, with some of greater value than others for the clinical setting.

### Competency Importance Level Ratings

Results from the demographic data indicated that 41% of the participants spend over 75% of their working hours in the clinic, with an additional 12% spending over 50% of their time in the clinic. These statistics emphasize the value of competencies most relevant to the treatment techniques commonly administered within the confines of the clinic, namely injury assessment, manual

**Table 6.** Group Differences Using Post Hoc Analysis - Years as ATC

Competency Statement	Between Groups Comparisons (years)	Standard Error	P
(Q2D) Measure the active and passive range of motion using a goniometer and inclinometer	(0-5) x (6-10)	.081	.570
	(0-5) x (11-15)	.089	.551
	(0-5) x (16+)	.082	.048
	(6-10) x (11-15)	.092	.079
	(6-10) x (16+)	.086	.001*
	(11-15) x (16+)	.093	.735
(Q4B) Know the principles of physics and basic concepts associated with the electromagnetic spectra	(0-5) x (6-10)	.091	.826
	(0-5) x (11-15)	.100	.578
	(0-5) x (16+)	.092	.000*
	(6-10) x (11-15)	.104	.965
	(6-10) x (16+)	.097	.000*
	(11-15) x (16+)	.105	.004*
(Q4C) Know the principles of physics and basic concepts associated with the acoustic spectra	(0-5) x (6-10)	.092	.927
	(0-5) x (11-15)	.101	.863
	(0-5) x (16+)	.093	.000*
	(6-10) x (11-15)	.105	.997
	(6-10) x (16+)	.098	.007*
	(11-15) x (16+)	.106	.030
(Q12L) Explain components of the budgeting process, including purchasing, requisition, bidding, and inventory	(0-5) x (6-10)	.102	.073
	(0-5) x (11-15)	.111	.262
	(0-5) x (16+)	.103	.003*
	(6-10) x (11-15)	.116	.982
	(6-10) x (16+)	.108	.704
	(11-15) x (16+)	.117	.521

\* Statistically significant finding ( $P < .01$ )

therapy skills, therapeutic modalities, and therapeutic exercise techniques. Three of the five content areas pertaining to clinical settings (Orthopedic Evaluation and Diagnosis, Therapeutic Modalities, and Conditioning and Rehabilitation Exercise), derived from the 4<sup>th</sup> edition of the *Athletic Training Educational Competencies* document, consisted of competencies receiving the highest importance level ratings. Arguably, these three content areas include the competencies most relevant to novice ATs entering clinical practice settings.

**Demographic Factors**

*Gender*

When exploring the relationship between competency importance level presented in this research and certain demographic factors, several differences between groups were discovered. First, female participants, who represented 48.4% of the population in this study, perceived the importance of seven competencies higher

than the male participants for entry-level ATs pursuing careers in the clinical setting. As with previous research,<sup>3</sup> it seems female ATs frequently rate the importance of athletic training education program competencies at a higher level than male ATs.

*Highest Degree*

The participants holding a master’s degree perceived competencies pertaining to the systems of the human body and gaining knowledge of specific objective diagnostic exams for injuries as being of greater importance than respondents holding a bachelor’s degree. These particular competencies may pertain more to a AT in a physician extender role within a clinic where patient illnesses and viewing diagnostic scans would be more prevalent. If that presumption is true, then it may be possible that there is a greater percentage of practitioners in this study holding a master’s degree who are responsible for a physician extender role within clinics.

**Table 7.** Group Differences Using Post Hoc Analysis - Years in Clinical Setting

Competency Statement	Between Groups Comparisons (years)	Standard Error	P
(Q2D) Measure the active and passive range of motion using a goniometer and inclinometer	(0-5) x (6-10)	.079	1.000
	(0-5) x (11-15)	.084	.226
	(0-5) x (16+)	.092	.006*
	(6-10) x (11-15)	.095	.386
	(6-10) x (16+)	.103	.024
	(11-15) x (16+)	.106	.543
(Q4B) Know the principles of physics and basic concepts associated with the electromagnetic spectra	(0-5) x (6-10)	.089	.773
	(0-5) x (11-15)	.094	.076
	(0-5) x (16+)	.104	.000*
	(6-10) x (11-15)	.107	.551
	(6-10) x (16+)	.116	.002*
	(11-15) x (16+)	.120	.100
(Q4C) Know the principles of physics and basic concepts associated with the acoustic spectra	(0-5) x (6-10)	.092	.927
	(0-5) x (11-15)	.101	.863
	(0-5) x (16+)	.093	.000*
	(6-10) x (11-15)	.105	.997
	(6-10) x (16+)	.098	.007*
	(11-15) x (16+)	.106	.030
(Q12L) Explain components of the budgeting process, including purchasing, requisition, bidding, and inventory	(0-5) x (6-10)	.090	.949
	(0-5) x (11-15)	.095	.478
	(0-5) x (16+)	.105	.004*
	(6-10) x (11-15)	.109	.849
	(6-10) x (16+)	.118	.041
	(11-15) x (16+)	.122	.257

\* Statistically significant finding ( $P < .01$ )

*Educational Route*

No significant differences were found between participants who graduated from athletic training curriculum programs and those who became certifies via the internship route. Regardless of the educational program background, the AT would have comparable roles and experiences in the clinical setting and perceive the importance level of competencies similarly.

*Age and Years Experience*

The participants within the oldest age group perceived competencies pertaining to the scientific principles associated with therapeutic modalities and the mechanical principles applied to the design and use of therapeutic exercise equipment as of greater importance than participants in younger age groups. The participants with the most years as an AT and those with the most experience in a clinical setting also perceived the competencies pertaining to scientific principles associated with therapeutic

modalities as of more importance than the participants classified as younger or less experienced. The older, more experienced participants may believe students would benefit from an understanding of the physics and scientific principles behind therapeutic modalities prior to working in clinical settings at the entry-level. The more experienced ATs and those with more experience in clinical settings also rated the competency pertaining to the skill in using instruments to measure joint range of motion as of higher importance than participants with less experience as ATs and less clinical experience. Perhaps experienced practitioners place more importance of objective data supplied by these instruments for comparisons and monitoring progress during the rehabilitation process, while younger participants and those with less experience perceived budgeting, purchasing, and inventory skills as more important. The younger ATs in clinical settings may be more involved in outreach responsibilities that carry with it purchasing and budgeting for supplies to service the institution they were covering.



**Table 8.** Group Differences Using Post Hoc Analysis - Clinical Practice Setting

Competency Statement	Between Groups Comparisons (clinic type)	Standard Error	P
(Q2D) Measure the active and passive range of motion using a goniometer and inclinometer	HB x OAR	.101	.880
	HB x PO	.114	.808
	HB x SS	.096	.065
	OAR x PO	.096	.146
	OAR x SS	.074	.000*
	PO x SS	.091	.620
(Q4A) Know the physiological and pathological process of trauma, wound healing, tissue repair, and their implications on the selection and application of therapeutic modalities	HB x OAR	.085	.106
	HB x PO	.096	1.000
	HB x SS	.081	1.000
	OAR x PO	.081	.114
	OAR x SS	.062	.004
	PO x SS	.076	.998
(Q12K) Describe the concepts and procedures for third-party insurance reimbursement including the use of diagnostic (ICD-9-CM) and procedural (CPT) coding	HB x OAR	.130	.509
	HB x PO	.147	.998
	HB x SS	.124	.033
	OAR x PO	.123	.240
	OAR x SS	.095	.497
	PO x SS	.117	.005*
(Q12L) Explain components of the budgeting process, including purchasing, requisition, bidding, and inventory	HB x OAR	.128	.145
	HB x PO	.145	.869
	HB x SS	.122	.997
	OAR x PO	.122	.003*
	OAR x SS	.093	.052
	PO x SS	.115	.511

\* Statistically significant finding ( $P < .01$ ); Key: HB = Hospital-Based Clinic, OAR = Outpatient-Ambulatory-Rehabilitation Clinic, PO = Physician Owned Clinic, SS = Secondary School Clinic

Upon further examination of the demographic data, it was observed that as number of years in the clinic and years as an AT increased, there was a decrease in the number of participants employed in Secondary School Clinic setting, and an increase in the percentage of hours worked in the clinic. These results provide evidence that novice clinical ATs may spend a greater portion of their time providing outreach services and fewer working hours in the clinic than their experienced counterparts.

*Clinical Practice Setting*

Clinical ATs employed in Outpatient-Ambulatory-Rehabilitation clinics perceived the competencies pertaining to skills necessary in the operation of joint range of motion measuring instruments and understanding the tissue healing process as of greater importance than ATs employed in Secondary School Clinic settings. While ATs employed in Physician Owned clinics perceived understanding third-party reimbursement as being of greater

importance than ATs employed in Secondary School Clinics, ATs employed in Outpatient-Ambulatory-Rehabilitation and Physician Owned Clinics are likely to be more involved in rehabilitation in the clinic and possibly the reimbursement of services provided through insurance. ATs employed in Secondary School Clinics, on the other hand, have more responsibilities related to providing outreach services to high schools and colleges under contract.

*Percentage of Total Hours within Clinic*

ATs who spend the greatest amount of time in the clinic (over 75%) perceived competencies containing the knowledge requirements of planes of body movement, medical terminology and documentation, and the skill acquisition of instruments that measure joint range of motion to be more important than practitioners spending less than 25% of their time in the clinic. The ATs working over 75% of the time in the clinic also perceive the importance of documenting objective measurements

**Table 9.** Group Differences Using Post Hoc Analysis - Percentage Working Hours in Clinic

Competency Statement	Between Groups Comparisons (%)	Standard Error	P
(Q1F) Know the directional terms and cardinal planes use to describe the body and the relationship of its parts	(0-25) x (26-50)	.084	.776
	(0-25) x (51-75)	.102	.627
	(0-25) x (76-100)	.073	.004*
	(26-50) x (51-75)	.104	.980
	(26-50) x (76-100)	.076	.125
	(51-75) x (76-100)	.095	.545
(Q1J) Know medical terminology and documentation	(0-25) x (26-50)	.057	.059
	(0-25) x (51-75)	.070	.109
	(0-25) x (76-100)	.050	.001*
	(26-50) x (51-75)	.071	.998
	(26-50) x (76-100)	.052	.770
	(51-75) x (76-100)	.065	.942
(Q2D) Measure the active and passive range of motion using a goniometer and inclinometer	(0-25) x (26-50)	.088	.584
	(0-25) x (51-75)	.107	.019
	(0-25) x (76-100)	.076	.000*
	(26-50) x (51-75)	.109	.259
	(26-50) x (76-100)	.080	.046
	(51-75) x (76-100)	.100	1.000

\* Statistically significant finding

to monitor therapeutic exercise progress as greater than practitioners working 26% to 50% of the time in the clinic. It was understandable that ATs working the greatest number of hours in the clinic would rate competencies that pertain most to the evaluation and treatment of patients in a clinical rehabilitation setting as areas of greatest importance for entry-level ATs pursuing careers in that environment.

*Additional Competencies Recommended*

Less than 24% of the participants in this study volunteered suggestions for additional competencies needed by entry-level ATs pursuing careers in clinical settings (130 suggestions in total). All of the competency categories recommended were included in competencies from past and present athletic training competency document editions. Although not significant in number when considering the entire population, communication and documentation skills represented 16% and 13% of the total suggested additional competencies respectively making their mention a point of interest. Some of the documentation skills suggested were the ability to document the information recognized by the billing industry, the ability to use current documentation technology, and the ability to document patient treatments and outcomes. These suggestions make reference to documentation of information needed for adequate communication among colleagues and required by third-party payers. Also, the skill necessary to operate various injury recording software systems

was deemed important. Specific communication skills mentioned were patient education, affectively communicating with patients, physicians, coaches, and other health care professionals. These suggest the importance of patient-practitioner rapport for patient satisfaction and compliance. The statements also suggest the need for accurate communication with other health care providers and coaches for consistent patient status and injury management. In addition to the listings of communication theories and techniques as cognitive competencies, the 4<sup>th</sup> edition competencies document also stated interpersonal communication skills as a foundational behavior of professional practice.<sup>10</sup>

Since the completion of this study, the 5<sup>th</sup> edition educational competencies have been published. The results of this current study continue to have relevance as the 5<sup>th</sup> edition of *Athletic Training Educational Competencies* are consistent with the 4<sup>th</sup> edition regarding communication skills.<sup>16</sup> There is a slightly greater emphasis on educating patients in the 5<sup>th</sup> edition, but the foundational behaviors listed under the professionalism subcategory are identical. The consistent mention of communication by the respondents could indicate that the athletic training education programs may not completely evaluate the skill.

Participants who spend over 75% of their working hours in the clinic contributed the majority of the suggestions for communication

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**Table 10.** Recommended Additional Competencies

Competency	Frequency	Percentage of Total Additional Competency Suggested
Communication	21	16%
Documentation	17	13%
Functional Assessment	11	8%
Bracing-Splinting-Casting	9	7%
Knowledge of Illness	8	6%
Manual Therapy	8	6%

skills, further emphasizing the importance of this area of knowledge to the responsibilities of a AT in a clinical environment. Because these categories were addressed in the present and past competency documents, their mention may mean specific areas within the categories need to be addressed that are not. It may also represent possible faulty transfer of learning from didactic to clinical settings and the need for greater emphasis in athletic training education programs. The participants suggesting the addition of communication and documentation skills also rated the level of importance of the existing competencies that pertained to these skills higher than the average rating of all the participants. This could be considered a form of comparative analysis which ensures credibility, accuracy, and validity of the data while reducing measurement errors.

The importance of communication skills for clinical practitioners has been emphasized in prior research using populations of experienced and novice clinicians.<sup>17, 18, 19</sup> Novice physiotherapists practicing in Australia with fewer than five years experience perceived themselves as not being prepared in communication skills with clients.<sup>17</sup> The authors of this research suggested the educational programs for these professionals consider balancing the learning of technical and interpersonal skills. Experienced physical therapists in the United States demonstrated more patient-practitioner social interchange and gave patients a greater explanation of treatment, while inexperienced therapists were much more procedural and mechanical in their interactions with patients.<sup>18</sup> Physical therapists practicing in Canada with more than 15 years of experience perceived the level of importance of categories in professional ethics and attitudes, interpersonal relations, and societal awareness as higher than novice physical therapists.<sup>19</sup> The practitioners with up to two years of experience in this study perceived categories of evaluation, treatment, and creative thinking of higher importance than experienced practitioners. These results suggested practitioners with greater longevity in their discipline tend to emphasize the importance of ethics and communication skills, while novice practitioners express importance in more technical attributes. The results from this literature suggest that health care educational programs should consider a balance of technical skills with communication skills by highlighting the curriculum from both perspectives.

### Limitations

This survey study explored the perceptions of the participants as they currently exist and not past or future perceptions. Although the survey was piloted to ensure its clarification, misunderstanding

of the content or intent of a specific competency could still occur which would influence the clinical AT's perceptions creating a limitation in the importance ratings. The entire clinical setting population could not participate due to the sampling of NATA members only, filtering a portion of the total number of email addresses in the NATA database, incorrect email addresses, and spam filters on their computers.

The response rate for this survey (15%) would be considered by most to be low. Contributing factors could be the length of the survey and possibly the time of the year (December) the survey was distributed. Other factors specific to the type of survey conducted may be the novelty aspect of electronic surveys has passed and the prominence of filtering software by computer owners indicating electronic surveys as unsolicited e-mail and a viral threat to the system resulting in deletion of the message or notification. An incentive approach, such as a lottery, to help bolster response rates was not used since this could potentially undermine the credibility of the survey.

A low response rate does not necessary imply non-response error or bias.<sup>20</sup> The participants of a survey may not differ in any measurable way from those who chose not to respond.<sup>20</sup> In fact, there is evidence that surveys with very low response rates can be more accurate than surveys with much greater response rates.<sup>21</sup> Although the response rate in this survey was low, it is supported by a substantial population size acquired by unbiased sampling, consequently the non-responses were randomly distributed not suggesting non-response bias.

Although the potential for response bias may be greater with a low response rate, there is no specific response rate that ensures an unbiased representation of a population.<sup>22</sup> The potential for response bias may have a greater association with subject matter being investigated.<sup>22</sup> For example, sensitive topics such as abortion may result in lower response rates and increase the chance of response bias. The subject matter under investigation in the present research is noncontroversial in nature.

There may be specific competencies from other content areas that would be considered relevant to employment in clinical settings, but additional content areas would result in a cumbersome instrument. Although the clinical proficiencies contained in the content areas addressed by this study are composed of integrated psychomotor and cognitive competencies, not including them could be considered a limitation of this study.

Although the 5<sup>th</sup> edition of educational competencies is now in print, the purpose of this study was to discover if the 4<sup>th</sup> edition contained adequate competencies for the preparation of entry-level ATs seeking careers in clinic job settings as perceived by ATs employed in this setting. Information from the current study can still serve to inform the professional preparation of students who seek employment in the clinic job setting.

### Future Research

This exploratory investigation suggests multiple avenues of further inquiry. A continuation of this research to include populations of ATs employed in other settings, including college-university, secondary school, professional sports, industrial, and corporate is recommended to provide specific information about differences among practice settings. A more substantial interpretation of the existing competencies requires investigating perceptions in each distinct practice setting to determine which competencies should be included or excluded. Additional stakeholder populations to survey include experts, employers, and patients in each employment setting to reach a consensus of the importance of existing and recommended additional competencies. These results could then be compared to those obtained from practitioners to inform future curricular decisions.

### CONCLUSION

Because the lowest level of importance given a competency by the participants in this study was between somewhat important and important on the importance rating scale, it could be argued that all the existing competencies listed in this research are needed to prepare athletic training students for entry-level careers in clinical settings. However, the demographic data demonstrated that differences occurred between multiple groups within factors, including gender, age, highest degree, years as an AT, years in a clinical setting, clinical practice settings, and percentage of total working hours spent within the clinic. As for additional competencies needed in athletic training education curriculums, the categories of communication skills and documentation skills were most frequently recommended by the participants who volunteered suggestions. The data provided by this work could positively influence future curriculum development, continuing education programs, potential fellowships or residencies, and post-professional specialty certification programs.

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