Comparing Instructional Methods in the Knowledge Acquisition of Musculoskeletal Anatomy in Athletic Training Students
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Context: The importance and difficulty of teaching and learning musculoskeletal anatomy has been documented previously. Little is recorded about the selection and implementation of instructional strategies to improve knowledge acquisition of anatomy in athletic training students (ATS). Objective: To compare the effect of traditional instructional methods (lecture, models, and charts) with traditional instructional methods plus a computer based instruction (CBI) simulation program on knowledge acquisition of musculoskeletal anatomy in undergraduate ATS. Design: A quasi-experimental, pre-test post-test counterbalanced comparison design. Participants were randomly assigned to one of two conditions. Group one received traditional instructional methods only for lower extremity course content and traditional instructional methods plus the CBI simulation for upper extremity course content. Group two participated in reverse order. Setting: A 3-credit undergraduate Anatomy and Physiology I course at a public university. Participants: A convenience sample of 24 ATS was used. Students were eligible to participate if seeking a Bachelor of Science degree, and no prior university-level A&P coursework. A majority of participants (70.8%) were 19 years of age or younger and had earned 0-29 credits (77.1%). There were slightly more men (56.3%) than women (43.8%). Interventions: A CBI simulated cadaver dissection program consisting of dissection, animation, imaging, and self testing modules. Main Outcome Measures: Student scores on pre and post-test upper and lower extremity multiple choice and practical examinations (split half correlation coefficient = .784). T-tests and repeated measures ANOVA with alpha levels of .05 were used to determine significant differences between the two conditions. Results: For the lower extremity there was a significant main effect for written and practical examination scores (F=263.24, P<.001) and a significant test score by intervention interaction (F=15.60, P<.001). Post hoc testing revealed that test scores were significantly greater (t=2.75, p=.012, ES=1.12) in the CBI group (M=36.67, SD=5.55) compared to the traditional group (M=30.67, SD=4.69). There were no significant differences in the pre-test scores (t=-.529, p=.602) between the CBI (M=19, SD=4.69) and traditional (M=19.92, SD=3.75) groups. For the upper extremity there was a significant main effect for written and practical examination scores (F=246.33, P<.001) and a significant test score by intervention interaction (F=196.02, P<.001). Post hoc testing revealed that test scores were significantly greater (t=3.17, P=.004, ES=1.29) in the CBI group (M=39, SD=3.16) compared to the traditional group (M=31.42, SD=7.66). There were no differences in the pre-test scores (t=-.219, P=.829) between the CBI (M=18.67, SD=4.4) and traditional (M=19.17, SD=6.59) groups. Conclusions: Both groups of participants had increases in pre-post test scores; however, participants utilizing traditional instructional methods plus CBI had greater post-test scores. The addition of a CBI simulated cadaver dissection improved knowledge acquisition of lower and upper extremity musculoskeletal anatomy in undergraduate ATS. Further work is needed to determine why this effect occurred. Word Count: 448