IJAHSP
The Internet Journal of Allied Health Sciences and Practice
http://ijahsp.nova.edu

A Peer Reviewed Publication of the College of Allied Health & Nursing at Nova Southeastern University
Dedicated to allied health professional practice and education
http://ijahsp.nova.edu Vol. 9 No. 1 ISSN 1540-580X

Students Provide Accurate, But Not Always Detailed, Feedback to a Peer Performing an Orthopedic Assessment Skill

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CITATION: Marty, M., Henning, J., Willse, J. Students Provide Accurate, But Not Always Detailed, Feedback to a Peer Performing an Orthopedic Assessment Skill. *The Internet Journal of Allied Health Sciences and Practice. Jan* 2011. Volume 9 Number 1.

ABSTRACT

Context: Athletic training students often practice psychomotor skills with their peers when learning skills and often assess one another and provide feedback. There is limited research examining the accuracy of the assessment and quality of the feedback athletic training students provide. **Purpose:** To examine the accuracy of the assessments and the quality of the feedback students provide to a peer performing an orthopedic special test (i.e., psychomotor skill). **Design:** Non-experimental repeated measures. **Setting:** Entry-level master's athletic training program. **Participants:** First year (n = 6) and second-year (n = 5) graduate students. **Main Outcome Measures:** During two separate sessions, subjects evaluated ten videos of a peer performing the FABER test for hip pathology. Accuracy of the assessments was examined through percent correct scores. The feedback was categorized as either comments provided on items performed incorrectly or items performed correctly. Quality of feedback was categorized as detailed or general. **Results:** Subjects assessed videos of a peer performing the FABER test with 97.83% accuracy. The subjects provided a total of 451 comments; 297 comments for items performed incorrectly and 154 comments for items performed correctly. The subjects provided detailed feedback 54.32% of the time and provided general feedback 45.68% of the time. **Conclusions:** Students can accurately assess a peer performing an orthopedic assessment skill and they also provide accurate feedback. However, the feedback is not always detailed. A peer assessment/feedback training program may improve the quality of feedback students provide.

INTRODUCTION

Athletic training educators and researchers have advocated for the use of peer assessment and feedback as methods to practice and improve the clinical skills of athletic training students.[1-4] Athletic training students often practice psychomotor skills together when trying to learn and refine skills.[1,5] Students also assess each other in the laboratory and clinical education settings.[5] Peer assessment is defined as students determining the level or quality of work of a peer and is often accompanied by peer feedback which is when students provide formative information to improve their peer's future performance of a skill.[6] Our operational definition of peer assessment/feedback (PAF) is when students assess their peers' skills or knowledge and provide them with feedback in order to improve future skill performances or application of material. Athletic training students can benefit from the use of PAF because it supplements instructor assessment/feedback and increases the amount of feedback the students receive.[1,7] Feedback that is corrective can improve future performances and possibly increase clinical competency.[4]

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Researchers have begun to examine PAF within the athletic training student population during their professional preparation. A national survey of 933 athletic training students found that students frequently use PAF in the clinical education setting.[5] Our previous research indicates that athletic training students can accurately assess a videotaped performance of a peer practicing psychomotor skills.[8] In this same study, we found that students could reliably assess the videotaped performance on more than one session.[8] A different experimental study examined the grades and perceptions of athletic training students who attended a review session led by a peer tutor and students who attended a review session led by a laboratory instructor.[3] There were no differences in exam grades between the two groups and those who worked with the peer tutor were more confident and less anxious than students who reviewed with the laboratory instructor. Interestingly, the students were uncertain if the peer feedback was more helpful than the feedback from the laboratory instructor.[3]

It is evident that students who participate in PAF and can accurately assess each other. However, the quality of the feedback that students provide to each other is unknown. Understanding the quality of the feedback provided by students will help construct guidelines for improving the PAF experiences. Thus, the purpose of this study was to further substantiate the accuracy of peer assessment and determine the quality of the associated feedback students provide to a peer practicing an orthopedic assessment skill.

METHODS

Subjects

A total of 11 students (six first-year students and five second-year students) enrolled in an accredited entry-level master's athletic training education program during the fall 2008 semester were recruited to participate in this study. The first-year students were currently enrolled in an orthopedic assessment course and the second-year students took the same course the prior academic year. All subjects had previous experience in assessing their peers' psychomotor skills in other athletic training laboratory courses. First-year students previously used PAF in the following courses: applied anatomy, care and prevention, and therapeutic modalities lab, while second-year students had prior experience in a general medical conditions course and a therapeutic exercise lab in addition to the courses listed above.

Instrumentation

Data was collected using a skill assessment sheet for the FABER test (an orthopedic diagnostic test for hip pathology) and was adapted with permission from an athletic training education text meant for peer and clinical instructor evaluation of psychomotor skills.[9] The skill assessment sheet divided the FABER test into nine specific items: three for patient position, three for examiner position and three for test performance. The nine items were considered critical aspects of the skill. Subjects assessed the performance of each individual item by circling "yes" or "no" thereby indicating whether or not that component of the broader skill had been performed correctly by their peer. There were three lines after each item to allow subjects to provide their peer with written feedback.

Procedures

The university's Institutional Review Board approved the study prior to data collection. Subjects received instruction on the FABER test using the components identified on the skill assessment sheet described above. Subjects who were first-year graduate students were instructed on the skill as part of an orthopedic assessment course in which they were currently enrolled. Subjects who were second-year graduate students relied on the instruction of the skill they received in the same course one year prior. All subjects were provided the FABER assessment sheet one week prior to data collection in order to familiarize themselves with the assessment items.

A repeated measures design was used to determine the accuracy of the peer assessment scores as well as the quality of the feedback on two separate sessions. The first PAF session was completed the week after FABER skill instruction was conducted during week nine of a 15-week course and the second PAF session occurred during week ten. The subjects evaluated a series of videotaped performances of a peer practicing the FABER test on a mock patient. Each PAF session began with a video segment that was considered to be an accurate performance of the FABER test based on the skill assessment sheet. The subjects then watched ten video segments of a peer performing the FABER test with various intentional errors (e.g., incorrect examiner position or incorrect force applied). The subjects were instructed to pause the video after each individual video segment in order to complete their assessment and provide written feedback. Video segments could not be rewound and subjects were instructed to use visual and auditory cues present in the videos in order to assess their peer's performance and provide written feedback. The subjects were asked to provide feedback in a manner similar to how they provide feedback when practicing laboratory skills in real time and were not prompted on whether feedback should be specific or on items performed correctly/incorrectly. The order of the video segments was counterbalanced between the two viewing sessions to prevent a learning effect. There were 15 intentional errors in each series of videos and creating 15 opportunities in each PAF session for

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each subject to provide corrective feedback. Thus, there were a total of 330 opportunities for all subjects to provide written feedback across both PAF sessions. There were 75 items performed correctly during each PAF session in which the subjects could have provided feedback, thus 1650 opportunities for all subjects to provide feedback on items performed correctly over both PAF sessions.

Data Analysis

The principle investigator determined the "expert assessment" of each video segment prior to data collection in order to compare the accuracy of the subjects' assessments of the skill performance. A panel of five certified athletic trainers with a minimum of seven years of clinical experience reviewed the scores of the principle investigator for accuracy and to ensure a valid expert assessment. Accuracy of the peer assessments and quality of the feedback provided were examined separately.

The accuracy of the subjects' skill assessment was measured by percent correct score. Subjects assessed a total of 90 individual items during each PAF session (i.e., 9 items per 10 video segments). Percent correct scores were computed by dividing their assessment score by the expert score. For example, a subject that accurately assessed 87 out of 90 possible items would have a percent correct score of 96.67%. A repeated-measures analysis of variance with between-subjects (year) and within-subjects (session) was performed to assess differences in accuracy among year in program and between sessions.

Feedback was categorized in two ways. First, feedback was categorized by the quality of the written comments provided. Feedback quality was categorized as "detailed" if it was descriptive and specific as to what was performed correctly or needed to be done to improve future performance of the skill. Feedback quality was categorized as "general" if it was not detailed and/or did not describe what needed to be done in order to become proficient in performing the skill. For example, if the patient's foot was placed on the opposite ankle instead of above the superior pole of the patella, "foot was placed too low" would be rated as "general" and "foot needs to be placed higher, above the superior pole of the patella" would be rated as "detailed." Similarly, if the foot was correctly placed on the superior pole of the patella, "great patient positioning" would be rated as "general" and "the foot was properly placed on the superior pole of the patella" would be rated as "detailed." The feedback was also categorized as either being provided on an item performed correctly or incorrectly.

A repeated-measures analysis of variance with between-subjects (year) and within-subjects (session) was performed to assess differences in the quality of feedback among classes and between assessment sessions. The a priori alpha level was set at $p \leq 0.05$. SPSS software (version 15.0; SPSS Inc, Chicago, IL) was used to analyze the data.

RESULTS

Accuracy of Peer Assessment

The subjects were 97.58% accurate during the first set of PAF videos and 98.08% accurate during the second set of PAF videos one week later. The overall accuracy was 97.83%. A percent correct score of 80% (a B level) was considered the minimal acceptable level since the program in which the subjects are enrolled requires a minimum grade of B in all courses. All subjects scored above an 80%. The lowest accuracy score was 91.1%, and there were five perfect assessments (see Figure 1). There were no differences between subjects' accuracy scores on the two different sessions, $F(1,9) = 0.30$, $p = 0.57$. Furthermore, the main effect of year in program was not significant, $F(1, 9) = 1.88$, $p=0.20$, nor was the interaction of session and year in program, $F(1, 9) = 0.80$, $p=0.34$.

Place Figure 1 here.

Quality of Peer Feedback

The subjects provided a total of 451 comments after watching a peer performing the FABER test. The subjects provided feedback for 90.00% (n = 297/ 330) of the items performed incorrectly. No incorrect feedback was given on items performed incorrectly. Feedback on items performed correctly was only provided 9.33% of the time (n = 154 /1650). The subjects assessed 1980 total items over the two testing sessions. Feedback was not provided on 77.22% (n = 1529/1980) of the items.

Secondly, the quality of the feedback provided was examined (see Table 1). Overall, subjects provided detailed feedback 54.32% (n = 245/451) of the time and provided general feedback 45.68% (n=206/451) of the time. The main effect of session was not significant, $F(1,9) = 0.29$, $p = 0.61$; nor was the main effect of year in school $F(1,9) = 0.29$, $p = 0.60$. The interaction of session and year in school was also not significant, $F(1, 9) = 0.08$, $p=0.78$.

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Table 1. Frequency of feedback categories for session and year in program (%).

	Feedback Category	Session 1	Session 2	Overall
First Year	Detailed	84 (63.64)	88 (60.27)	**172 (61.87)**
	General	48 (36.36)	58 (39.73)	**106 (38.13)**
Second Year	Detailed	42 (46.15)	31 (37.80)	**73 (42.2)**
	General	49 (53.85)	51 (62.20)	**100 (57.8)**
Overall	Detailed	125 (56.05)	119 (52.19)	**245 (54.32)**
	General	**98 (43.95)**	**109 (47.81)**	**206 (45.68)**

We further examined the data to determine if subjects were more likely to provide feedback when part of the skill was performed incorrectly rather than reaffirming feedback when skills were performed correctly. Therefore, we categorized the quality of the written feedback by whether it was provided on items performed incorrectly or items performed correctly. The subjects provided 297 comments for items performed incorrectly; 52.52% (n = 156/297) of the comments were general and 47.48% (n = 141/297) were detailed and intended to provide corrective information. The subjects provided 154 comments on items performed correctly; 75.32% (n = 116/154) of the comments reaffirmed correct performance of the skill. Of the comments provided on items performed correctly, 11.04% (17/154) were suggestions on how to improve the non-critical aspects of the skill; this accounted for 3.77% (17/451) of the total comments. For example, one item the subjects assessed was that their peer stood to the side of the patient. One subject circled yes, meaning the item was performed correctly, but also provided feedback "but standing too distal-need to stand more proximal in order to put sufficient pressure on ASIS."

One confounding factor when trying to examine the feedback was an incorrect assessment. A small percentage (1.33%, n = 6/451) of the total feedback provided was based on an incorrect assessment. The feedback provided was correct, but based on an incorrect assessment of the skill. For example, the subjects assessed whether the patient's foot was placed on the opposite knee, just above the superior pole of the patella. In one video, the peer placed the patient in the correct figure four position with the foot just above the patella. However, one subject incorrectly assessed it as wrong and wrote "the foot was placed mid-thigh as opposed to just above the patella" as feedback. Thus, the subject did not accurately assess the item, but provided corrective feedback based on the incorrect assessment.

An unexpected finding involved subjects providing feedback for a different item than the one they actually assessed. This occurred 3.33% (n = 15/451) of the time. The feedback provided was correct in all cases. One video in particular was troublesome for the subjects. The patient was positioned in internal rotation instead of external rotation when placing the patient in the figure-four position and this was the item performed incorrectly. The subjects were asked to assess if the peer in the video pressed the knee to the table, which the peer did. But a few subjects assessed this item wrong and provided feedback about the wrong patient position. In actuality, the subjects provided correct feedback, but assessed the wrong item on the check off sheet because they were distracted by a different item that was performed incorrectly. In practice, this would not affect the student being evaluated because the feedback would indicate what specifically was performed wrong. In this perspective, the accuracy would have been 98.59% overall.

DISCUSSION

The results of this study indicate that athletic training students can accurately assess videotaped performances of a peer practicing the FABER test. The subjects made very few errors in their assessments and had an overall accuracy of 97.8%. We set the minimal acceptable percent correct score at 80% because that is the minimal acceptable level for a passing grade in the athletic training education program at our institution. Thus, the subjects in this study scored at a level that exceeded expectations. We conducted a similar study in athletic training and found similar results.[8] In our previous research, subjects who were also entry-level athletic training students assessed ten videos of a peer performing three different orthopedic assessment skills on two separate sessions. The students were 96.8% accurate when assessing the manual muscle test of the middle deltoid, 94.8% correct when assessing the FABER test and 97.1% accurate when assessing the Slocum drawer with internal rotation. Similar to this study, there were no significant differences in accuracy between first year students and second year students. Nor were there any differences in accuracy between the first assessment and the second assessment. This indicated that first-year students were able to accurately assess, even though they just learned the material the prior week, and second-year students were able to retain the information learned the year before. The current study provides further evidence that peer assessment can be incorporated into athletic training education as a legitimate pedagogical tool.

While students in this study could accurately assess their peers, the associated feedback they provided was not always detailed. Regarding the feedback on items performed incorrectly, students could clearly identify which components of the FABER test

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were performed incorrectly. However, the feedback provided to their peer needs improvement. More than half of the written comments provided were too general and therefore deemed not corrective. This is an important finding because literature suggests that effective feedback should be detailed and specific,[10] Thus, students may benefit from some form of training on how to provide their peers with detailed corrective feedback when a skill is performed incorrectly.

We also examined the feedback that students provided a peer on components of the FABER test that were performed correctly. Most of the feedback provided reinforced that the peer was performing the skill correctly. This is a positive finding and supports previous research that suggests students may experience increased confidence when they understand a skill well enough to reaffirm a peer's performance.[11] It is also thought that providing reaffirming feedback would increase a student's willingness to accept similar comments on their own performance from a peer.[11] Peer feedback may be especially helpful when the instructor is unable to observe every time a student practices a skill.

Interestingly, athletic training students in our study were more likely to provide feedback on items performed incorrectly than provide feedback on items performed correctly. In contrast to our findings, researchers in medical and physical therapy education programs found that students were more likely to provide reaffirming written feedback regarding skills performed correctly than corrective feedback on those performed incorrectly.[11,12] Specifically, medical students who received formal training on how to give and receive feedback provided four times as many positive comments than negative comments.[11] The authors thought that a higher percentage of positive comments would promote the acceptance of corrective feedback from a peer.[11] Similarly, results from a two-year study examining written peer feedback of group presentations provided by fifth year master of physical therapy students indicate that students provide positive feedback to their peers greater than 74% of the time compared to negative or neutral feedback.[12] These two studies examined PAF with interviewing skills and presentations where they assessed and provided feedback on items that have more personal interpretation, i.e., "Did the group utilize methods to make their presentation interactive and interesting?"[1,12] This is in contrast to our study that inspected PAF of discrete psychomotor skills where it is very cut and dry as to whether the patient was laying supine, for example, and may explain why we found that students provide more feedback on items performed incorrectly. Also, the subjects in the current study have used PAF in several classes as a way to practice and perfect their skills and being informed of what is performed wrong and how to improve future performances is vital. The subjects in our study may see PAF as a necessary formative step in order to become proficient in their psychomotor skills and thus, will provide feedback on a majority of items performed incorrectly.

While we examined peer assessment and peer feedback separately, in practice, these are not mutually exclusive and often occur together. Students in our study occasionally provided feedback on items they incorrectly assessed. In reality, this type of feedback would likely spark a discussion between students and lead to a deeper level of understanding of the skill for both participants.

In further support of PAF, a variety of other benefits have been reported in other disciplines that may be transferrable to athletic training education. The use of PAF in courses that have large student enrollment numbers allows students to receive feedback at a faster rate in situations where faculty cannot provide detailed feedback to all students.[13] However, PAF in athletic training courses should supplement instructor and clinical instructor assessment and feedback, not replace it.[1] It is suggested that engagement in the assessment process requires students to reflect on course material which enhances their understanding.[14,15] Other documented benefits of PAF include engagement in self assessment and reflection, increased accountability, enhanced problem solving skills, and increased confidence.[14-21] Similar benefits may be seen in athletic training students which may improve their feedback to their patients as a certified athletic trainer after graduation.

Limitations and suggestions for further research

The current study has several limitations. Data were collected at one university in one entry-level master's athletic training education program. Results may be different in different schools due to program structure. Repeating this study in multiple programs would provide a more comprehensive examination of PAF. Similarly, results may be different for undergraduate students compared to our entry-level graduate students due to possible differences in the length of time of the program, maturity, and prior experiences providing feedback. Additionally, only 11 subjects were examined. Although the study is descriptive in nature, a greater number of subjects would show more insight into how athletic training students assess each other and provide feedback. The current study only examined one orthopedic assessment skill. Different psychomotor skills, cognitive competencies, and professional behaviors can be examined to further evaluate the effectiveness of PAF.

Subjects in this study provided accurate, but not always detailed, feedback. Several researchers exploring PAF in higher education have stated that some type of training or guidelines would be beneficial and may enhance the quality of feedback, improve students' acceptance of feedback, as well as increase the accuracy and/or reliability of that feedback.[3,4,17,18] A PAF

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training program that provides information on how to provide feedback, shows students examples of detailed feedback and improper feedback, allows students to practice PAF in a non-threatening environment, and encourages the students to discuss concerns of PAF could improve the feedback that students provide and needs to be examined. Other areas for further investigation include the comparison of a detailed rubric verses global evaluations as a means to provide peer feedback. In the current study the subjects used a detailed rubric where the nine critical aspects for the FABER test were described. Differences in the quality of feedback may exist if the subjects are provided more general instructions such as "assess and provide feedback to your peer performing the FABER test," rather than a detailed list that may guide their comments. Furthermore, the effects of PAF during classroom education on performances in the clinical education setting and the effects of PAF during professional preparation on a certified athletic trainer's ability to provide PAF as a professional are areas of further exploration.

CONCLUSIONS

Our study is the first study to examine the feedback that athletic training students provide to a peer performing a psychomotor skill. The study also provides further evidence that athletic training students are highly accurate when assessing videos of a peer performing an orthopedic assessment skill. This is critical because students can best improve their clinical skills when they are given accurate and descriptive feedback. Accuracy of peer assessments and quality of peer feedback is important to examine because educators need to ensure they are using evidence based educational techniques and this should also increase the acceptance of PAF. We provide several areas for further research. Most importantly, the quality of the feedback that athletic training students provide each other could improve. A PAF training program is a method that could develop feedback skills and needs to be investigated.

REFERENCES

1. Henning JM, Weidner TG, Jones J. Peer-assisted learning in the athletic training clinical setting. *J Athl Train.* 2006;41(1):102-108.
2. Knight K. *Assessing Clinical Proficiencies in Athletic Training: A Modular Approach*. 3rd ed. Champaign, IL: Human Kinestics;2001.
3. Weidner TG, Popp JK. Peer assisted learning and orthopaedic evaluation of psychomotor skills. *J Athl Train*. 2004;42(1):113-119.
4. Henning JM, Marty MC. A practical guide to implementing peer assessment in athletic training education. *Athl Ther Today*. 2008;13(3):30-33.
5. Henning JM, Weidner TG, Marty MC. Millennial generation athletic training students benefits from multiple types of peer assisted learning. Paper presented at: National Athletic Trainers' Association Educators' Conference; February 21, 2009; National Harbor, MD.
6. Topping KJ, Ehly SW, eds. *Peer-Assisted Learning*. Mahway, NJ: Lawrence Erlbaum Associates; 1998.
7. Liu N, Carless D. Peer feedback: the learning element of peer assessment. *Teach High Educ*. 2006;(3):279-290.
8. Marty MC, Henning JM, Willse JT. Students are accurate but not always reliable assessing a peer performing athletic training psychomotor laboratory skills. *J Athl Train*. 2010(accepted for publication).
9. Amato H, Hawkins C, Cole S. *Clinical Skills Documentation Guide for Athletic Training*. 2nd ed. Thorofare, NJ: SLACK Incorporated; 2006.
10. Shute V. Focus on formative feedback. *Rev Educ Res*. 2008; 78(1):153-189.
11. Rudy DW, Fejfar MC, Griffith C, Wilson JG. Self- and peer assessment in a first-year communications and interviewing course. *Eval Health Prof*. 2001;24(4)436-445.
12. Miller PJ. The effect of scoring criteria specificity on peer and self-assessment. *Assess Eval High Educ*. 2003;28(4):383-394.
13. Ballantyne R, Hughes K, Mylonas A. Developing procedures for implementing peer assessment in large classes using an action research process. *Assess Eval High Educ.* 2002;27(5):427-441.
14. Vickerman P. Students perspectives on formative peer assessment: an attempt to deepen learning? *Assess Eval High Educ*. 2008;34(2)221-230.
15. Papinczak T, Young L, Groves M. Peer assessment in problem-based learning: a qualitative study. *Adv Health Sci Educ*. 2007;12(2):169-186.
16. Erickson GP. Peer evaluation as a teaching-learning strategy in baccalaureate education for community health nursing. *J Nurs Educ.* 1987;26(5):204-206.
17. Ladyshewsky R, Gotjamanos E. Communication skill development in health professional education: the use of standardized patients in combination with a peer assessment strategy. *J Allied Health*. 1997;23(4):177-186.
18. Hanrahan SJ, Isaacs G. Assessing self- and peer-assessment: the students' views. *High Educ Res Dev*. 2001;20(1):53-70.
19. Flynn JP, Marcus MT, Schmadl JC. Peer review: a successful teaching strategy in baccalaureate education. *J Nurs Educ*. 1981;20(4):28-32.

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20. Papinczak T, Young L, Groves M, Haynes M. An analysis of peer, self, and tutor assessments in problem-based learning tutorials. *Med Teach*. 2007;29(5):e122-e132.

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