

▲ Perceptions and Attitudes of Athletic Training Students Toward a Course Addressing Psychological Issues in Rehabilitation

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In 1999, athletic training adopted new educational competencies and clinical proficiencies addressing the following domains: (1) risk management, (2) assessment and evaluation, (3) acute care, (4) general medical conditions and disabilities, (5) pathology of illness and injury, (6) pharmacologic aspects of injury and illness, (7) nutritional aspects of injury and illness, (8) therapeutic exercise, (9) therapeutic modalities, (10) health care administration, (11) professional development and responsibilities, and (12) psychosocial development and responsibilities. These newly adopted competencies and proficiencies have improved the academic preparation of future certified athletic trainers. However, the addition of the 12th domain, psychosocial development and responsibilities, still may not provide athletic training students with a thorough understanding of the complex issues surrounding psychological adjustment to injury. This research study examined athletic training students' perceptions and attitudes before and after completing a new course addressing psychological issues of injury. *J Allied Health* 2005; 34:101–109.

PAIN, limited range of motion, and decreased strength are effects and symptoms that are commonly experienced following injury. However, denial, depression, anger, anxiety, and fear can also occur as a result of injury. Although allied health professionals who perform orthopedic assessments are academically well prepared to care for the physical ailments associated with injury, some are much less adept at designing rehabilitation and treatment programs aimed at addressing psychological reactions.¹ The potential for help-

ing allied health professionals such as certified athletic trainers (ATCs) and physical therapists recognize both the physical and the psychological ramifications of injury should begin with academic preparation.

Currently, undergraduate athletic training students (ATs) are expected to receive formal instruction in 20 different subject matter areas, and transitional clinical doctorate physical therapy (TDPT) students are expected to demonstrate competency in 20 areas.^{2,3} One of the revised subject matter areas in athletic training has been changed from "psychology" to "psychosocial intervention and referral."^{2,4} This requires that ATs not only learn to recognize the range of psychological reactions experienced following injury and illness but also how to intervene and recognize the need for referral. For TDPT students, psychology is less specific. Competencies such as communication, individual and cultural differences, and screening indirectly incorporate psychosocial interventions.³ Yet, in order to meet the Commission on Accreditation of Allied Health Education Programs (CAAHEP) standards and guidelines for athletic training and the Commission on Accreditation in Physical Therapy Education (CAPTE) competencies for physical therapy, psychosocial subject matter could be covered in one lecture within an established course or addressed for an entire academic quarter or semester. A course specifically designed to address the psychological problems encountered throughout the rehabilitation process is not required; therefore, to include such a course would be a decision by a college or university to address the standards as established by CAAHEP or CAPTE. Such a course may increase awareness by preparing the ATs or TDPT students to meet and effectively manage the many cognitive, emotional, and behavioral challenges that arise from the grief response.⁵ This study was designed to provide one large midwestern National Collegiate Athletic Association (NCAA) Division I university with summative data regarding changes ATs experienced in perception and attitude following such a course. Hence, this study attempts to answer the following questions.

1. Does an ATs' perception of an injured student-athlete's psychological response to injury change following the

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TABLE 1. Number of Rehabilitations Each Respondent Observed From Pretest to Posttest

No. of Rehabilitations	Frequency		Percentage	
	Pretest	Posttest	Pretest	Posttest
0-5	4	3	21	15
6-10	2	3	10	15
11-15	0	1	0	5
16-20	1	0	5	0
21-25	1	1	5	5
26-30	1	1	5	5
30+	10	10	52	52

completion of a college course on the psychological impact of injury?

- Does an ATS's perception of the impact of injury on a student-athlete's continued academic success change following the completion of a college course on the psychological impact of injury?
- What is the perceived value of a college course addressing the psychological impact of injury?

Methods

We enrolled 19 students in the new course (12 women and seven men). Four were freshmen who were finishing prerequisite coursework to enter the athletic training education program (ATEP), 14 were enrolled in the ATEP (six sophomores, four juniors, and four seniors), three were seniors in the internship program, and one was an ATC in graduate school. However, each student had experience working in athlete clinical care at high schools or at other colleges or universities. Tables 1 and 2 illustrate the students' experiences. We obtained informed consent from each respondent and institutional review board approval before conducting the field and pilot tests to establish

TABLE 2. Number of Weeks of Instruction on the Psychology of the Injured Athlete Each Respondent Reported, Independent of Basic and Introductory Psychology

Weeks of Psychology Instruction	Frequency		Percentage	
	Pretest	Posttest	Pretest	Posttest
0-1	13	14	68	73
2-3	5	2	26	10
4-5	1	1	5	5
6-7	0	0	0	0
8-9	0	1	0	5
10+	0	1	0	5

instrument validity and reliability and before conducting the actual research study.

Because the frame was a convenience sample and the power was not at the usual accepted level of 0.80, we used a combination of questionnaire and interview methodologies to triangulate the data and gain insight into ATSs' perceptions of psychological reactions experienced by student-athletes. Both questionnaires and interviews were conducted in a pretest and posttest format. All 19 students completed both questionnaires, and six students were selected to complete both interviews. Tables 3 and 4 present the pretest and posttest schedule.

QUESTIONNAIRE

The original seven-point Likert-scale questionnaire (1 = strongly disagree; 7 = strongly agree) was mailed to seven content experts and three instrument design experts to establish face and content validity. We revised the scale, constructs, and items in light of the feedback and comments. We conducted an additional field test using three

TABLE 3. Schedule of Pretest Data Collection

Date	Respondent	Location	Method
November 21	Female sophomore (Lori)*	Classroom	Interview
November 22	Female senior (Whitney)	Classroom	Interview
	Male senior (Tom)	Classroom	Interview
November 29	Male sophomore (Steve)	Classroom	Interview
January 2	15 students	Classroom	Questionnaire
January 3	Female sophomore (Bonnie)†	Dorm study room	Interview
January 5	Female junior (Reese)‡	Classroom	Interview
January 8	Female junior (Vickie)‡	Athletic training office	Interview
January 9	5 students	Classroom	Questionnaire

*Lori dropped the course prior to the first day of class.

†Bonnie was chosen to replace Lori.

‡Reese and Vickie were interviewed during the first week of class to replace the two juniors who became seniors upon the change from fall to winter quarter. Whitney and Tom had been juniors and their status changed to seniors following fall quarter, making them the only two seniors in the course.

TABLE 4. Schedule of Posttest Data Collection

Date	Respondent	Location	Method
May 22	Female senior (Whitney)	Classroom	Interview
May 22	Female sophomore (Bonnie)	Dorm study room	Interview
May 22	Female junior (Vickie)	Athletic training office	Interview
May 23	Male sophomore (Steve)	Classroom	Interview
	Female junior (Reese)	Classroom	Interview
	Male senior (Tom)	Classroom	Interview
May 30	11 students	Classroom	Questionnaire
June 1	7 students	Classroom	Questionnaire
June 4	1 student	Faculty office	Questionnaire

ATCs. The ATCs were given the randomized items and told to place them within the most appropriate construct. Following an analysis of the results, items within constructs were eliminated, moved to other constructs, amended, and in some cases replaced with new items in an effort to represent constructs more appropriately. The third field test was conducted with a set of ATCs at a neighboring university. The ATCs provided feedback regarding the clarity of items, which resulted in revision of a few items. The fourth attempt to revise the questionnaire was a pilot test, which attempted to establish reliability.

This pilot test was administered at a neighboring college and measured internal consistency within each construct. An a priori Cronbach's α of 0.70 was set for acceptance of each construct, and items within a construct with an item-total correlation of <0.25 were considered suspect and analyzed relative to their exploratory and conceptual value to the questionnaire. All suspect items were eliminated or revised.

The result created a 30-item, seven-point Likert-scale questionnaire with four constructs (i.e., stress reactions, sport influences, social influences, and academic impact) and one construct containing seven demographic items. The stress reactions construct contained five items aimed at determining ATCs' perceptions of common psychological reactions student-athletes experience as a result of athletic participation and/or injury (e.g., motivation, daily stressors, anxiety, and so on). Sport influences, as a construct with four items, addressed factors such as stress of injury in revenue sports versus nonrevenue sports; stress of injury relative to Division I, II, and III; and stress of injury compounded by the timing of injury (e.g., preseason vs. in-season). Social influences contained six items and attempted to assess the importance ATCs' placed on the quality, type, and provider of social support (listening, emotional support, and so on) during injury and the ATCs' perceived importance a student-athlete's family socioeconomic factors (e.g., mother's level of education, household income) have on the reaction to injury. Academic impact, the last construct, included eight items aimed at ATCs' per-

ceptions of student-athletes' class and rehabilitation session attendance following injury, the level of academic support provided to injured student-athletes, and the persistence to graduate following injury.

We delivered the pretest questionnaire to 14 students on the first day of class and five students on the second day of class. The course was 10 weeks long, and we delivered the posttest questionnaire 11 weeks following the conclusion of the course in order to assess philosophical and value changes as opposed to memorization or "test preparation learning." (Table 5 details the lecture topics for each class, which met only once a week.) We used SPSS (version 10.0; SPSS Inc., Chicago, IL) to assess the change in ATCs' perceptions from pretest to posttest and to present descriptive statistics of the demographic items. For data entry purposes, if no more than three items per construct were unanswered, we used a mean substitution of the respondent's responses within the respective construct.⁶ We calculated the difference scores between four summated and ranked pretest and posttest constructs for all questionnaires (i.e., demographics excluded), and we determined statistically significant rank scores by the Wilcoxon signed rank test, with an a priori α level of 0.05 (two-tailed). The small sample size provided the researchers with the most compelling reason to use a nonparametric test. Unlike the *t* test, nonparametric tests do not require that the following two assumptions be met: independence and normal distribution. Both assumptions seemed unrealistic in light of the small sample size ($n = 19$).

INTERVIEWS

Before the actual interviews, we conducted two pilot test interviews at a neighboring college to obtain feedback regarding the clarity and flow of questions. Revisions to the question order and the addition of one question were made based on respondent feedback. We conducted the pretest interview 5–6 weeks before the first day of class for three respondents and during the first week of class for the other three respondents. The posttest interview was administered 10 weeks following the conclusion of the

TABLE 5. Course Schedule Topics

Week of the Quarter	Lecture Topic
1	Questionnaire administered to 14 students Review of rehabilitation process Sports Medicine Team
2	Questionnaire administered to 5 students Theories and literature on psychological impact of injury
3	Common psychological stress reactions resulting from injury
4	Sport influences on the psychological response to injury
5	Mid term examination
6	Injury influences on the psychological response to injury
7	Psychosocial developmental theory Personal influences on the psychological response to injury
8	Personal influences on the psychological response to injury
9	Social influences on the psychological response to injury
10	Students case study presentations

course. Delaying the final data collection 10 weeks was purposeful. The researchers believed that if the students had truly assimilated and accommodated the material taught throughout the quarter, their practice techniques and opinions will be more accurately assessed in a time frame that goes beyond the date of the final examination. This concept is supported in current progression of competence theory.⁷

Interviews were conducted with the use of a semi-structured interview guide to facilitate the conversational flow of the interview. For example, all interviews began with warm-up questions that addressed a student's reason for entering the ATEP, what aspects of the profession he or she enjoyed, and so on. The main questions asked students to describe psychological reactions they had observed in student-athletes and techniques they had used. Questions regarding student-athletes' academic resources and time conflicts between classes and rehabilitation sessions were also posed. Responses were not categorized during the interview, and respondents were given a transcribed copy of the interview within two weeks in order to provide a member check for data accuracy. No respondent suggested any changes to his or her interview transcript. Following the member check, we hand coded and peer reviewed themes that emerged upon reading the transcribed interviews. Pretest and posttest interviews were hand coded separately, and the emergent

themes were then compared to determine the change in ATS perceptions.

Results

QUESTIONNAIRE

Following completion of both the pretest and the posttest questionnaires, the constructs were summated and ranked. For each construct, a difference score was obtained from the pretest to the posttest. The Wilcoxon signed rank test was then used to determine the significance and direction of that change. As a means to report an additional measure of reliability, another internal consistency was measured on the actual pretest delivered to the respondents in class. Table 6 provides an overview of the construct α s and item-total correlations. The five items in stress reactions produced an α of 0.5455, with no items scoring <0.25 on the item-total correlation. The four items within sport influences produced a slightly higher α ($\alpha = 0.6168$) with one suspect item (item 9 = 0.0352), which did test as 0.2476 in the pretest. Social influences scored an α of 0.4365 with two suspect items (item 11 = 0.0992, item 13 = 0.1198), with only item 13 scoring low in the pretest and subsequently amended. Academic impact, the last construct, produced the highest α (0.6857), with one suspect item (item 21 = 0.1462, 0.1711) in the pretest and pilot test, respectively. The item was not removed but was amended following the pilot test.

The lower α in the pretest as compared with the pilot test was attributed to two phenomena: the small sample size and the characteristics of the sample. In the field and pilot tests, respondents were members of NCAA Division III schools, where the high profile of athletics is nearly absent. In contrast, the actual sample is composed of students attending a high-profile NCAA Division I university. The differing perspectives of the students may have impacted the manner in which respondents answered. As a result, the low α s produced from the actual research data make it inappropriate to conclude that the PPIQ (Perceptions of Psychological Impact of Injury Questionnaire) is not reliable. According to Mueller (1986),⁸ "coefficients of psychological measures seldom ever approach 1.00 and frequently are below 0.50." Thus, it is plausible to conclude that the PPIQ has some measure of reliability but is less well constructed than other scales.

The demographics construct revealed that respondent ages ranged from 18 to 26 years on the pretest with a mean age of 20.21 years ($SD = 1.84$). Of the 19 respondents, 63% were female ($n = 12$) and 36% were male ($n = 7$). According to the data gathered on the first day of class, 21% of the respondents were freshmen ($n = 4$), 31% were sophomores ($n = 6$), 21% were juniors ($n = 4$), 21% were seniors ($n = 4$), and only 5% were graduate students ($n = 1$). Eleven of the students were enrolled in the ATEP, three were seniors in the internship program, and one was a graduate student.

The remaining four had not yet finished the prerequisite coursework to enter the ATEP; however, each had experience working in athlete clinical care at high schools or at other colleges or universities.

Two additional background questions were asked in both the pretest and the posttest questionnaires to estimate how much student experiences had changed from pretest to posttest, which spanned 21–22 weeks. Table 1 presents the estimated number of rehabilitations each student reported observing for the pretest and the posttest. Rehabilitations were defined as any injury that requires therapeutic exercises to return to preinjury function. Table 2 provides an estimation of the number of weeks of instruction each student reported having on the psychology of injury for the pretest and posttest periods. Students were not asked to provide an absolute count of the number of rehabilitations and weeks of instruction. The questionnaire only asked each respondent to estimate the number, which in some cases changed to a lesser estimate in the posttest. Students were specifically instructed not to count basic or introductory psychology courses or the current course in the estimated weeks of instruction. As shown, there does not appear to be a large percentile change from pretest to posttest in both tables. Although the events spanning from pretest to posttest could not be held constant for each respondent, the results shown in Tables 1 and 2 provide an idea of how much the collective experiences of the respondents changed from pretest to posttest.

Table 7 presents the four analyzed constructs and the ranks scores. The change in perceptions from pretest to posttest questionnaires in the stress reactions construct was not statistically significant ($p = 0.126$, two-tailed), which indicated that respondents did not change in their perceptions of the amount and types of stress reactions student-athletes experience (e.g., motivation, daily stressors, anxiety). The three remaining constructs, sport influences, social influences, and academic impact, showed a statistically significant change from pretest to posttest questionnaires ($p = 0.024$, two-tailed; $p = 0.001$, two-tailed; and $p = 0.003$, two-tailed, respectively). Within the construct of sport influences, 13 of the 19 respondents changed their perceptions to a higher summated score on the posttest, which indicates that the respondents became more acute in their ability to recognize the importance of sport influences (e.g., Division I vs. Division III, time during season, and so on) on the degree of psychological distress experienced as a result of injury. The social influences construct reported 16 positive ranks (i.e., higher summated scores on the posttest), indicating that all but three of the respondents recognized the important of social influences (i.e., social support, socioeconomic status) on the degree of psychological distress experienced by injured student-athletes. The degree of change in ATSS' perceptions relative to the construct of academic impact from pretest to posttest was also statistically significant. Sixteen of the 19 respondents scored the posttest

TABLE 6. Internal Consistency of PPIIQ Constructs

Construct	Pilot Construct α	Pilot Construct Correlation	Pretest Construct α	Pretest Item-Total Pretest
Stress reactions	0.6958		0.5466	
1		0.2708		0.2329
2		0.5370		0.2398
3		0.3112		0.4708
4		0.3830		0.2148
5		0.4137		0.5470
Sport influences	0.7072		0.6168	
6		0.3178		0.5045
7		0.5744		0.5134
8		0.6312		0.6250
9		0.1732		0.0352
Social influences	0.7844*		0.4365	
10		0.7677		0.3178
11		0.5344		0.0992
12		0.4615		0.2687
13		-0.4300		0.1198
14		0.4551		0.4184
15		0.3014		0.2178
Academic impact	0.7261†		0.6857	
16		0.3044		0.4968
17		0.1679		0.2890
18		0.6301		0.3609
19		0.5207		0.3832
20		0.1475		0.3742
21		New item		0.1462
22		-0.7263		0.5381
23		0.2947		0.4936

*Reflects the α without item 13, which was reworted but not removed because of its substantive worth.

†Reflects the α with items 22 and 23, which were not removed because of their substantive worth.

questionnaire construct addressing the academic impact of injury with a higher summated score.

INTERVIEWS

We have changed the names of the respondents to protect their identities. Two students from each class (i.e., sophomore, junior, and senior) were selected to be interviewed. Bonnie and Steve are sophomores, Vickie and Reese are juniors, and Whitney and Tom are seniors. Ideally the researchers preferred to interview a man and a woman from each class; however, the junior class did not have any male students.

Due to the qualitative component of this study, the reader is cautioned against generalizing the interview results. The voices in this study may not be transferable to other students. Additionally, the common themes may not be transferable to other students. Thematically, two findings seemed to recur throughout all interviews: social support and self-esteem. Students seemed to express the need for the ATC to understand the student-athletes in order to

TABLE 7. Wilcoxin Signed Ranks Distribution of Questionnaire Constructs Change Scores

Construct	n	Mean Rank	Sum of Ranks	p
Stress reactions*				
Negative ranks	5	7.70	38.50	0.126
Positive ranks	11	8.86	97.50	
Ties	3			
Total	19			
Sport influences*				
Negative ranks	5	6.80	34.00	0.024
Positive ranks	13	10.54	137.00	
Ties	1			
Total	19			
Social influences*				
Negative ranks	2	4.50	9.00	0.001
Positive ranks	16	10.13	162.00	
Ties	1			
Total	19			
Academic impact†				
Negative ranks	2	8.75	17.50	0.003
Positive ranks	16	9.59	153.50	
Ties	1			
Total	19			

*Stress reactions, sport influences, and social influences are constructs that establish the degree of change in ATS's perceptions concerning a student-athlete's psychological reaction to injury.

†Academic impact is a construct that establishes the degree of change in ATS's perceptions of the academic impact of injury on a S-A's continued academic success following injury.

provide social support. Respondents also seemed to become more confident as practitioners. They appeared to accept that people respond to stress differently and that an inability to return each athlete to function within the same time frame was not a matter of professional deficiency.

Sophomores

Overall, Bonnie believed that the new course should be made a permanent addition to the athletic training curriculum. She believed that the course went into depth to provide her with a sincere appreciation for what the student-athlete endures. She summarized by stating that the ATC almost becomes a psychologist, medical doctor, friend, counselor, and academic advisor all rolled into one. In conclusion, she believed that psychology and injury rehabilitation go "hand in hand." According to her, "You have to watch the psychological in order to fully evaluate the rehab."

The largest benefit Steve claimed to have gained from the course was a "better understanding of the whole psych of injury rehab process." He explained in the posttest that he had more ideas of why some athletes respond to rehabilitation better and how to deal with those who are not responding as well as others. Steve emphasized that the ATC needs to know when there might be a psychological

problem so that a referral can be made to a sport psychologist or counselor, who may be able to provide additional help. Lastly, Steve believed education plays the biggest role in the psychology of the rehabilitation. With education, Steve believed that ATCs and ATs can communicate to the injured student-athlete that he or she will not see improvements every day and that there will even be days when the student-athlete feels comparatively worse than the preceding day. But, according to Steve, the important thing to tell the injured student-athlete is that this type of progression is normal; ". . . let them know that they are doing what they need to be and they are doing a good job so they don't get frustrated."

Juniors

In the 11th week following the conclusion of the course, Vickie stated that the course "really opened her eyes...to stuff that we need to do differently." As the first step, she believed that ATCs must start by knowing their athletes on an individual basis. Vickie stated that it is the ATC's responsibility to know "how they [athletes] react in certain situations, to know their goals, and kinda know mentally where they are. . . ." She continued to explain that it is also the ATC's responsibility to educate injured athletes. She seemed to appreciate the importance of patient education and collaborating with the injured student-athlete in the development of the rehabilitation goals and plans.

From the beginning, Reese seemed to have an appreciation for the role of psychology in rehabilitation. Thus, it is difficult to determine how her attitudes changed, if at all. Reese only added two new concepts to her posttest comments that may account for attitudinal changes. First, she seemed to admit that she previously compared student-athletes' responses with the career-ending injury she experienced in high school. Although she mentioned that people handle problems individually in the pretest, it appeared that she might not have truly reconciled that individual coping mechanisms vary until the posttest. Second, she appeared to believe that the role of psychology in rehabilitation is simply to let athletes know that reacting emotionally to injury is normal. Overall, Reese believed that the course provided students with an appreciation for the importance of knowing athletes individually, taking the time to talk with them, and expressing the normalcy of emotions, which she believed would be especially applicable to those ATs who desire to work in a high school setting.

Seniors

Whitney openly admitted to incorporating techniques she learned in the course into her educational experiences as an ATs already. She stated, "I think I've used the knowledge I got from the class to expand on how I treat athletes after they get hurt. To kinda teach them more to make sense of the injury, to help them a little bit more. I've seen it help. . . ."

She also admitted that most ATCs and ATSs do not take the role of psychology in rehabilitation seriously enough. She explained, "I think it could be very helpful to know the athlete a little bit better, and know what kind of responses they might have to injury, know how to deal with their responses to the injury a little bit better." Moreover, she admitted that, following the conclusion of the course, she found the role of psychology in rehabilitation to be "a lot bigger than [she] expected. . . ."

Despite the fact that Tom mentioned the need to know athletes on an individual basis in the pretest interview, he claimed that the course gave him a "better appreciation for the mental involvement with your athletes, actually getting to know the individual, so that you can make decisions about the individuals." He explained that he now has a picture of a "more well rounded involvement with the athlete" as he viewed the role of psychology intertwined with the physical aspect of the rehabilitation. Specifically, Tom claimed that he now recognizes the importance of including the injured athlete in setting the goals and the design of the rehabilitation as well as the importance of educating the athlete and the utilization of imagery. Tom's only concern was the practicality of a holistic rehabilitation. He stated, "The time you have is very limited, and to incorporate a lot of the things that we learned in the class, sometimes doesn't seem practical."

Discussion

QUESTIONNAIRE AND INTERVIEW RESULTS

Of the four questionnaire constructs, three constructs (i.e., sport influences, social influences, and academic impact) showed a statistically significant change in perceptions from pretest to posttest. As a result, the 19 respondents who completed both the pretest and the posttest questionnaires seemed to gain more appreciation for the impact that timing of the injury, professional aspirations, coaches' reactions, teammates' reactions, and family's reactions can have on the degree of psychological responses a student-athlete may experience as a result of injury and the negative impact injury can have on academic achievement.

Only the first construct, stress reactions, did not show a statistically different change in perceptions from pretest to posttest. This may be attributed to an apparent familiarity with the concepts that the students exhibited during the first set of interviews. During the pretest interviews, all six of the interviewees were able to list and explain psychological responses that they had observed in injured student-athletes. Although the correct psychological terminology was not always used when referencing psychological reactions in the pretest interviews, each interviewee appeared to realize that there were some common responses that they were witnessing. In terms of the questionnaire, it would be plausible that the construct, stress reactions, would not change significantly from the pretest to the posttest if the phenomenon

observed in the interviews was in fact consistent within all the respondents. It appears that respondents gained a richer understanding of what can affect the degree of severity of those psychological responses (e.g., sport influences and social influences) and not necessarily what those responses are (e.g., denial, anger, depression, anxiety).

The value of the course seems to be supported by the interview results. Overall, it appears that the respondents became more empathetic practitioners. As a group, they were able to see beyond the stigma of "athlete" and look into the "person" who is affected by class demands, teammate and coach interactions, and family and personal relationships. Students were able to grasp the issues within and outside of athletics that can minimize or exacerbate the degree of psychological distress experienced by an injured student-athlete.

Two significant themes emerged throughout the posttest interviews: social support and self-esteem. One finding was the preponderance of evidence in the pretest and posttest interviews that seems to paint the ATS or ATC as a provider of social support. This is in stark contrast to the findings of two studies investigating sources of social support for student-athletes.^{9,10} Neither study identified ATSs or ATCs as providers of social support. Yet, all six interviewees mentioned empathy, moral support, or "checking in" as techniques for facilitating rehabilitation, and all six interviewees referenced situations in which ATSs can help tutor the student-athlete during times of academic strife. In fact Vickie stated, ". . . it's really nice to know that they feel comfortable to come to you, and they can talk to you about anything. . . ." This appears to be social support (i.e., listening, emotional support, and shared social reality). The second emergent theme in the interviews was the increased self-esteem many of the interviewees seemed to gain. Each ATS seemed to grow throughout the interview process, accepting that the variability of the pace or progress in rehabilitation is not always his or her fault or his or her inability to be a potentially "good" ATC. The interview process seemed to give each ATS a chance to reflect on how he or she was feeling (e.g., failure or guilt) and to understand what he or she can realistically be expected to accomplish given the fact that each student-athlete will react differently to stressors encountered from injury.

COMPARISON WITH THE LITERATURE

The ability of future allied health professionals to not only recognize psychological responses to injury but also to understand the factors that can heighten or eliminate those responses is imperative. This concept becomes clearer when taking into account Pearson and Petitpas' (1990) summary of the student-athletes who are most likely to have difficulty adjusting to injury.¹¹ According to Pearson and Petitpas (1990), student-athletes with a strong athletic identity, limited relationships, a discernible gap between athletic ability and aspiration, and a lack of psychosocial developmental

skills will have more difficulty adjusting to injury.¹¹ An ATC who understands these concepts and also appreciates the benefit of knowing his or her athletes is going to be better equipped to handle problematic psychological reactions that can impair rehabilitation and psychosocial development.

This finding is especially important in light of the newly adopted 2001 CAAHEP standards and guidelines and the 1999 National Athletic Trainers' Association athletic training competencies and proficiencies.^{2,12,13} Although no specific course is mandated, the new guidelines and proficiencies do call for subject matter and proficiency mastery in the area of "psychosocial intervention and referral." Specifically, the 1999 athletic training clinical proficiencies dictate that ATCs be able to "demonstrate the ability to intervene and make the referral to appropriate medical or allied medical professional" and "integrate motivational techniques used during rehabilitation."^{12,13} Verbal motivation, visualization, imagery, and desensitization are recommended motivational techniques. However, despite the validity and usefulness of these techniques, there are many other aspects to the psychology of injury that are not listed. Patient education is one example. Education may be the most critical component of a rehabilitation in terms of motivation and commitment of the injured student-athlete.^{14,15} Application of psychological theory is another example. Theory not only provides practitioners a basis upon which to develop rehabilitations but also can create the impetus for future research and improvements in the field of student-athlete health care. It is difficult to conceptualize that theory, patient education, various intervention techniques, and referral networks can be successfully taught in a week or two. For ATCs to internalize and become more empathetic and theoretical in their psychological interventions, a course should be created. The interview results in this study show that students not only learned but also assimilated and changed their value systems en route to more affective learning.

Clinically, the importance of a course dedicated to the psychological impact of injury is apparent when considering the results of two survey studies. Larson et al. found that <25% of surveyed ATCs had access to a sport psychologist, and Voight and Callaghan found that only 14% of surveyed Division I universities employed a full-time sport psychologist in their athletic departments.^{1,16} If most ATCs do not have access to a sport psychologist, the holistic health care of the injured athlete will likely suffer unless the ATC is trained in the psychology of injury and is capable of not only facilitating rehabilitation but also knowing when to make a referral to a more qualified medical practitioner.

The effect a course on the psychology of injury can have on student-athlete retention rates is also a consideration. The results of the questionnaire indicated that respondents who completed the course gained more appreciation for the effect an injury could have on a student-athlete's academic achievement as well as knowledge of appropriate referrals for academic support. The results of the interviews indicate

that the interviewees either were or became empathetic with injured student-athletes and their unyielding time demands. This is an especially important message to be delivering to future ATCs, especially those who plan to work in intercollegiate athletics. Ogilvie and Taylor (1993) and Smith et al. (1990) discovered that most Division I student-athletes are at risk for academic failure.^{17,18} In fact, most Division I student-athletes enter college with lower Scholastic Aptitude Test (SAT) scores and poorer high school preparation when compared with the general student body.^{19,20} It becomes imperative that the primary health care provider for student-athletes not only understand each student-athlete's physical limitations but also each student-athlete's socioeconomic and educational background so to appreciate the individual struggle academics can pose.

LIMITATIONS OF THE STUDY

There are two limitations with the research design used in this study. First, the treatment in this study was a college course. It was an elective; therefore, students who enrolled in the course probably were doing so because of an inherent interest in the material. The concern was that a population of students who were interested in the material could bias the results (i.e., selection bias resulting from a convenience sample). All but one of the interviewees, Bonnie, stated that the course was selected based on an interest in the subject matter or a need to improve their understanding of the student-athlete. This is particularly important because this is the one element of bias that was left uncontrolled in this study and could have potentially affected the external validity of the questionnaire results. The second limitation is the lack of a control group. However, a pretest was used to provide a baseline comparison for the respondents.

Conclusions

The current study provides a good exploration into future research questions. Two unanticipated themes such as practitioner self-esteem and social support are certainly two new areas to investigate in curricular outcomes. In addition, future studies can provide validation for a course designed to address psychosocial intervention and referral by replicating the current study using random selection and a larger sample size. Studies to analyze the effect of a psychology of injury course on other allied health professionals and their ability to provide social support is also necessary to challenge previous research that does not account for health care providers as sources of social support.^{9,10} Studies could also be conducted in Division I universities that do not employ a sport psychologist to determine if a psychology of injury course improves the quality of health care given to student-athletes as well as outpatient rehabilitation clinics that employ both ATCs and physical therapists.

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